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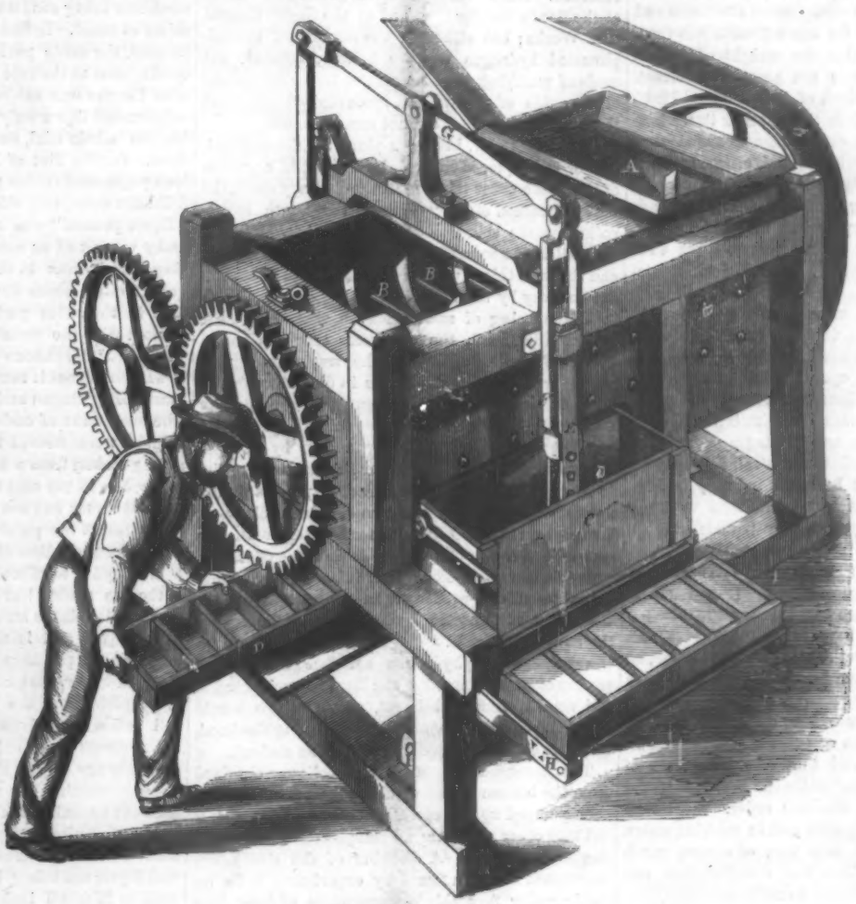
Improved Brick Machine.

Perhaps next to the indispensable pump, the brick-making machine has been the subject of as many patents as any other combination of mechanical movements. The engraving represents a very neat and compact, and apparently efficient machine, which is now extensively used, giving, we are told, excellent satisfaction.

The clay is fed into the mill at A, where it is ground by means of curved screw blades rotating between fixed horizontal arms, B, which serve to disintegrate the mass and to mix it thoroughly. The side curve of the blades gradually forces the mass to that portion of the mill in the rear of the mold box, C, where the blades are at right angles to the shaft, and not, as are the others, set spirally. The effect of this alteration in the set of the blades is to force the clay into the receiver, where it is compressed into the molds, D, by means of a plunger worked by the slide and arms, E and F, and the walking beam, G. The molds fed in at D traverse a bed, H, provided with rollers, the front part of which, under the receiver, C, is hinged and sustained by a spring which serves to keep the molds tightly against the bottom of the receiver, so that in the movement from under the receiver, they are "straked" off smoothly. The spring also gives if a stone or any other foreign substance offers resistance to the plunger. The stand, I, sustains one end of a shaft, bearing cams or eccentrics, by which the bed, H, can be raised or lowered to accommodate any size of bricks.



SEELEY'S BRICK MACHINE.

It may be driven by a belt, or, by the extension of the main shaft and the interposition of bevel gears, it may be worked by horse-power. The mechanical movements, which give motion to the plunger and the device for feeding in the molds, are compact, simple, and not liable to derangement. They are all absolute, so that there can be no failure of reciprocal action. The plunger can be stopped in its action at any time, if the clay is not sufficiently mixed for the production of bricks or tile, by the removal of a pin from the shank of the plunger, which will allow the vertical movement of the plunger connection, while the plunger itself is at rest. The plunger stroke can, by similar means, be graduated to any point desired.

Standing only four feet high, while others rise seven, eight, and nine feet, it is handy and can be easily fed. As the power can be applied at a distance from the machine, a team is never in the way, if animal power is used, as is the case where the machine forms the center of the sweep. If steam power is employed, the driving pulley can be placed at the geared end of the machine, and not be in the way of the feeder. This machine makes three revolutions of the cutters or grinding shaft to one operation of the plungers, thus insuring the thorough grinding of the clay. As the power that drives it is not necessarily applied directly to the machine, it can be worked close to the clay bank. It is now used also for the manufacture of peat, and is said to be efficient for this work. At the New York State Fair and the Albany County Fair it received the first premium. The inventor modestly claims that it makes 3,000 bricks per hour with the power of a span of horses.

It was patented May 8, 1866, by D. W. Seeley, Albany, N. Y., whom address for rights to manufacture or vend.

HOMOGENEOUSNESS OF STEEL—TIRES, AXLES, AND RAILS.

The application of steel to many of the purposes for which iron had been, and is now, generally used, is not, as commonly supposed, of very recent origin. Many patents have been issued for its application in large masses, or for its employment in situations where iron proved to be inconveniently weighty and bulky. As long ago as 1828 a suspension bridge at Vienna, over the Danube, was built, which was supported by steel chains. If our memory serves us right, built wheels for railway cars were imported into this country by one of our oldest railroad companies, when the road was first opened, which had welded steel tires. It is some years ago when this metal was first employed as the material for boilers.

But the difficulty in producing steel in sufficiently large masses, at a comparatively low cost, and free from flaws, with a perfect homogeneousness of material, seemed to present almost insuperable objections to its general employment in place of iron. Cast steel made by cementation, while possessing superior hardness, lacked tenacity. If tough, it was soft. If hard, it was brittle. In 1851, however, Krupp, of Essen, Prussia, showed in the London Exhibition an ingot of cast steel weighing 4,500 lbs., the heaviest then ever known. In 1862 he exhibited another one weighing 20 tuns, in the form of a solid cylinder, nine feet high and three feet eight inches in diameter. It had been broken across to show its fracture. Under a good microscope it would not exhibit a single flaw. Since then he has produced repeatedly masses of 40 tuns weight. For this purpose M. Krupp has a number of furnaces capable of melting 50 tuns each; but his great engine is the immense steam hammer, costing for construction and working about $600,000. It is rated as a 48-tun hammer, no other in the world being above 20 tuns. This hammer, or the movable part, is over twelve feet long, five wide and four thick, and is driven by a steam cylinder six feet in diameter.

The ingot of steel is heated, after casting, in a furnace, the bottom of which is a truck mounted on wheels. The sole is of fire-brick laid on an iron platform. The ingot is placed upon it by means of a crane, and, by steam power, run with the truck under the furnace. The doors being closed, it is heated, and, when brought to the proper temperature, is drawn out and lifted by the cranes to the *gros marteau*, or great hammer, turned and worked until it is perfectly homogeneous throughout, and brought to the form required.

Steel tires for locomotives are made from a slice cut from an ingot about ten inches diameter, which has been subjected to the hammer. The quantity cut off varies from 300 to 900 lbs. This section is raised to a red heat and a thin wedge is driven through its center, leaving an oval opening three-quarters of an inch in width. This is further opened by larger wedges, until the mass acquires a lozenge shape, when it is brought to a rough square, and a large mandrel introduced through the opening. By means of the hammer and this mandrel the ring is formed, and when circular is sub-

jected to the action of powerful rollers which bring it to its finished shape. It is then too small in diameter for a locomotive wheel, and, after being heated, is placed upon an iron platform in the center of which is a segmented cylinder, which, by means of a hydraulic press, gradually stretches the tire to its proper size. It is not afterward turned, only cleaned, and the weldless steel tire is finished. M. Krupp also casts steel car wheels in solid disks, which require no turning after leaving the mold. England and her colonies ordered from his works, in 1865, 11,396 steel tires and 564 steel axles.

We have made this somewhat lengthy notice of M. Krupp's method of working steel to show that, with the proper machinery, the fabrication of the articles mentioned is entirely practicable. Indeed, we do not require to go to Prussia to prove this fact. The firm of Winslow, Griswold & Holly, at Troy, N. Y., are busily engaged in this manufacture. Their orders for steel rails, especially, are beyond their present means of production.

There can be no reason, at this late day, and in view of the experiments made in England and on the continent, for doubting the superior durability and the ultimate superior cheapness of steel rails and tires over those of iron. On our railroads it is theoretically correct to say that the weight of a load rests on a point, but it is not practically correct. There is compression. Much of it in the road itself, or the rail, but some of it in the wheel or tire. Yet notwithstanding that it can be demonstrated that this compression makes what would otherwise be a level road one continually up hill, there are persons who advocate a yielding foundation, as there are those who insist on a springing or yielding tire. The mere fact that our ordinary locomotive tires must be occasionally re-turned is a sufficient refutation of their position.

A perfectly rigid bed, or roadway, and as rigid wheels, is the rule that is found by experience to be the best. Soon as a wheel, or tire gets "out of round" it becomes, in operation, a hammer, destroying the rail. Mr. Bessemer, at a recent meeting of the British Association at Nottingham, gave an exceedingly elaborate and interesting account of his own system of manufacturing steel, and showed the vast importance that branch of industry had assumed since his patent had come into working operation. By the old system forty pounds of steel was the largest mass of metal operated upon, but by his process as much as twenty-five tuns could be converted into steel in one heating. It had superseded iron wherever large castings were required—such as ordnance of large size, locomotive and marine engine cranks, rails, etc. He mentioned, as showing the superior durability of steel rails over those of iron, that at the station at Camden Town, at a part of the line over which all the traffic passed, a steel rail was placed on one side of the line and an iron rail on the other, and that seventeen faces of the iron were worn away while the first face of the steel rail was still in working order. Steel rails put down four years ago were still in working order. The first cost of steel rails was, of course, much greater than that of iron, but compensation was found for this in the greater durability.

The superintendent of one of our most successful railroads informs us that iron rails on that road average about seven or eight years of life. Steel rails have been recently introduced but the test is not considered sufficient to afford proper data for an opinion. Steel tires have been used on the road several years, some of them having already run 70,000 miles, and, while costing double the price of iron, their durability has proved that they are superior to iron ones. No such performance, we are certain, can be recorded for iron tires. The "best iron tires"—according to Thomas Prosser, C. E., who has lately issued a pamphlet on this subject, which should be a satisfactory exhibit to our railroad men—"average only 60,000 miles, during which time four of them will grind up one tun of rails."

It appears to be evident that our railroad companies will eventually save by replacing their iron rails, iron tires, iron wheels, and iron locomotive axles with those of steel, the rails to be laid on an unyielding and permanent foundation. Certainly, this subject of the comparative value of iron and steel for these purposes, is worthy more general attention than has been given it in this country, especially in the construction and "plant" of new lines of railways.

GAS PURIFICATION.

For some months past Mr. George Livesey has been testing, on a large scale, at the works of the South Metropolitan Gas Light Company, an important method, for which he has obtained a patent, of desulphurating the ammoniacal liquor, the object being to employ the ammoniacal liquor so purified for the purpose of removing the sulphureted hydrogen from the gas. It has long been known that caustic ammonia has a strong affinity for sulphureted hydrogen, and some years ago Mr. Laming attempted to utilize this fact by taking the foul ammoniacal liquor and passing it into a box containing oxide of iron, allowing it to stand for a short time, and then drawing it off free from sulphur. The liquor thus desulphurated was employed in a scrubber, and so far purified the gas that, on passing the latter through a vessel containing water only, it was found that the sulphureted hydrogen had been completely removed. Experiments with this process were tried at the South Metropolitan and at the Great Central Gas Works; but although the removal of the sulphureted hydrogen was, we believe, effected, the mode of purifying the ammoniacal liquor by the use of the oxide of iron was an inconvenient one, and the process, therefore, did not come into use.

According to Mr. Livesey's plan, the desulphurating of the liquor is effected by the aid of a portion of the waste gases taken from the chimney stack, the present method of proceeding at the South Metropolitan works being as follows:—A 5-inch pipe is inserted in the retort flue close to the chimney stack, and through this a portion of the waste gases are drawn away by the aid of an old exhauster, the 5-inch pipe being of such a length that, before the waste gases reach the exhauster they are cooled down. From the exhauster, the waste gases pass into a scrubber, 15 feet 6 inches in diameter and 24 feet high, filled with coke, where they are met by a descending stream of foul ammoniacal liquor distributed at the top in the ordinary manner by a couple of revolving perforated arms, or Barker's mill. The active agent in the desulphurating process is the carbonic acid of the waste gases, which displaces the sulphureted hydrogen in combination with the ammonia of the liquor, and thus in place of caustic ammonia a carbonate of ammonia is obtained, which experiments have proved to be quite as effective in absorbing sulphureted hydrogen from the gas as the caustic ammonia. We may mention here that the sulphureted hydrogen set free during the process of desulphuratting the liquor is conducted to the smoke stack and burnt, as its escape would otherwise constitute a nuisance in the neighborhood, but it is expected it will eventually be utilized.

The desulphurated ammoniacal liquor obtained from the bottom of the scrubber just mentioned is then pumped up into elevated tanks, from which it is led into other scrubbers, and employed for the purification of the gas. A scrubber of the size above mentioned has been found by experiment to be capable, under favorable circumstances, of desulphurating 640 gallons of foul ammoniacal liquor per hour; the average rate of working is, however, less than this, or about 550 gallons per hour. The quantity of waste gas required to effect the desulphurating of the liquor has not yet been ascertained precisely: but it has been calculated to be approximately about 2,000 cubic feet per hundred gallons purified. The liquor, after being used for effecting the purification of the gas, is again pumped into the foul liquor tank and re-desulphurated, and it can be used over and over again. It is found, however, that the liquor is slightly weakened by the desulphurating process, this weakening arising from the formation of a certain percentage of sulphite of ammonia, which, by the absorption of oxygen, is finally converted into the sulphate.

After numerous experiments, extending over a period of nine months, had been carried out on Mr. Livesey's process at the South Metropolitan works, a trial on the whole make of gas, amounting to 29,000 cubic feet per hour, took place on the 22d of May last. On that occasion two scrubbers, of the dimensions already given, were used with desulphurating liquor of barely five oz. strength, the first being supplied with 360 gallons and the second with 340 gallons per hour; and there was also a third scrubber worked with water, this being employed to remove the small proportion of ammonia carried over by the gas from the other scrubbers. The results of the trial were that the first scrubber removed between 70 and 80 per cent of the sulphureted hydrogen and about 20 per cent of the carbonic acid from the gas, and on the latter leaving the third scrubber, it was quite free from both sulphureted hydrogen and ammonia, and had given up half of its carbonic acid. The experiment was continued as long as the supply of the desulphurated liquor lasted.

On the 31st of May a more extended trial was commenced, this continuing until the 30th of June, and the make of gas during that time being 18,300,000 cubic feet, or 610,000 cubic feet per day. During this series of experiments one scrubber was used for effecting the desulphurating of the liquor, so as to keep up the supply, and the gas was acted upon by two scrubbers, one worked with the purified liquor and the other with water, the gas after leaving the scrubbers being conducted to the ordinary oxide purifiers as usual. Before the experiments were commenced, the oxide purifiers were "going off" or becoming foul at the rate of about once per week; but after the gas was subjected to the action of the desulphurated liquor only one purifier "went off" during the whole trial, and that not until the end of June. On the 31st of May box No. 2 stained the lead paper, and it was not until June 30th that No. 3 did the same, and this notwithstanding that the "liquor process" was stopped one day through a leaky valve, and on another through the pump getting out of order in the night, making a period of quite twelve hours during which the gas went direct to the oxide purifiers. The single scrubber worked with the desulphurated liquor was supplied with about 400 gallons of the latter per hour, and it was found that it removed 75 per cent of the sulphureted hydrogen and about half the carbonic acid. The bisulphide of carbon and other sulphur compounds were formed by Dr. Letheby's test, on an average taken from a number of experiments, to be reduced to 36 per cent below their amount when the purified liquor was not employed.

At present the plant at the South Metropolitan works does not allow of the process above described being applied to effect the purification of the whole of the gas made; but Mr. Livesey is, however, now erecting two large scrubbers for the desulphurating of the liquor, and is making other preparations for applying the process more completely. We should state, however, that, even when the new apparatus is completed, and the liquor system of purifying in full action, Mr. Livesey does not contemplate the entire disuse of the oxide of iron purifiers, but intends always to pass the gas through one or two boxes containing the oxide, so that in case of any accident hapening to the scrubbers the oxide would come into action and prevent foul gas from being sent out. The scrubbers for desulphurating the foul liquor are being built of brick, and they will each be 17 feet 6 inches in diameter inside and 20 feet high. Beneath them are large tanks, the one capable of holding 18,000 and the other 30,000 gallons of liquor. When the new brick scrubbers are completed, the three scrubbers, 15 feet 6 inches in diameter and 24 feet high, which are now used both for desulphurating the liquor and purifying the gas, will be required for the latter purpose only, and a fourth scrubber of the same dimensions, which is now being completed, will shortly be available for the same purpose. Under the new arrangements the waste gases will be led from the flue through a 12-inch main instead of by a 5-inch pipe, as at present, and it is probable that a condenser of the kind ordinarily used will be placed on the line of the main, so as to effect more thoroughly the cooling of the gases before they reach the exhauster.

At first the liquor was delivered by the pumps directly to the scrubbers; but now an elevated tank has been erected into which the pumps deliver, and from which the supply for the scrubbers is drawn. The tank is divided into four divisions, one being for the foul liquor which is to be desulphurated, and

the other three being intended for the reception of the purified liquor to be supplied to the scrubbers in which the gas is purified. It was supposed at first that there might be some deposition of tar in the pipes leading from these tanks or divisions, and the pipes were therefore led into another similarly divided tank sunk in the ground, other pipes leading from the divisions of this tank to the scrubbers. The sunk tank was intended to receive any tar which might drain down; but it has proved to be quite unnecessary, and has, indeed, occasioned some trouble from leakage taking place through the divisions separating the compartments.—*Mechanics' Magazine.*

Separating Phosphorus from Metals.

It is well known that phosphorus is a substance which prevents the production of pure qualities of iron and other metals, and all attempts to remove the same have hitherto failed. Mr. Carl H. L. Wintzer, of Hanover, has found that chlorine gas and chloride of calcium are adapted to obtain the desired result. Chlorine gas, as a simple element, does not decompose, and chloride of calcium is the only combination thereof which, at the different degrees of temperature which occur in practical metallurgy, neither volatilizes nor decomposes unless another agent be introduced. Other known combinations of chlorine, as chloride of magnesium, decompose even at the boiling point of water; chloride of sodium becomes volatile at a comparatively low temperature.

Mr. Wintzer therefore employs chlorine gas and chloride of calcium for the removal of phosphorus, in processes of melting ores and in the treatment of metallurgical products. He makes use of this gas and the salt in blast furnaces, as well as in the process of puddling, refining, and recasting, and in any kind of furnace and in all processes of melting, applying the gas direct or adding the prepared salt (chloride of calcium) in any convenient form; or employing solutions containing muriatic acid, with the simultaneous use of lime or calcareous substances, by which process chloride of calcium is formed at the moment of its application. Through the effect of chlorine gas and chloride of calcium on phosphatic ores and metals, volatile combinations of phosphorus are formed and thereby the phosphorus is removed. The process is as follows:—In smelting an ore of iron or other metal containing phosphorus as an impurity, the operator charges into the smelting furnace with the ore, chloride of calcium in the proportion of from five to twenty-five parts by weight for each part of phosphorus found by analysis to be contained in the ore, and in other respects the smelting operation is conducted in the ordinary manner. The resulting metal will be found much more free from phosphorus than if the ore had been smelted without the addition of chloride of calcium. In place of adding the chloride of calcium direct, lime and muriatic acid may be mixed separately with the ore, or may be otherwise applied in combination. It is more convenient, however, to employ chloride of calcium ready formed. Or, in place of employing chloride of calcium, chlorine gas may be used; the gas may be mixed with air and forced as a blast through the ignited charge in the furnace, or the gas itself may be blown through the melted metal after it is tapped out of the furnace. The quantity of chlorine thus applied should be from three to fifteen times the weight of the phosphorus contained in the ore or metal. Chloride of calcium or chlorine may be applied in a similar manner when remelting iron or other metals, when it is desired to separate phosphorus therefrom. Phosphorus can thus be separated from all metals to which a strong red heat can conveniently be applied; more especially, however, it is applicable to the treatment of iron and copper.—*Mechanics' Magazine.*

Punched Tubes and Gun Barrels.

The manufacture of punched steel tubes and gun barrels by Messrs. Deakin & Johnson's process, is likely to become a most important industry. The principal gun-barrel makers of Birmingham are now advertising that they are prepared to make fifteen thousand of these gun barrels weekly, and Messrs. John Brown & Co., of Sheffield, have nearly completed the erection of very heavy machinery for rolling the tubes, after punching, into barrels and jackets, for 7-inch rifled cannon. It is but a short time since even the most enterprising steel masters believed it to be impossible to punch a 10-inch hole down through an ingot two feet six inches in diameter and four feet high; yet this has already been accomplished, while, as for gun barrels, a single tube, of dimensions sufficient for the manufacture of four regulation barrels, is punched almost at a blow. The material employed is Bessemer steel, and it is indeed a question whether any other steel would permit of this mode of manufacture. With the least imperfection of the ingot, it cracks open or flies to pieces under the punch, and thus only perfect material can pass. As to the endurance of barrels made by this process, one test made at Birmingham, some time since, showed that a barrel of the Enfield pattern, punched from Bessemer steel, withstood, without injury, single charges of sixteen drams of powder and twenty-five Enfield bullets. The latter were forced into a continuous bar of solid lead when fired, yet the bore of the barrel remained intact.

The best gun barrels are now made of Marshall's iron, which is sold in skelps about 8 inches long, 5½ wide, and ⅛-inch thick, at, we believe, £28 per tun. Bored and ground and with the "lump" forged on, these barrels go into the gun trade at a cost of about 10s. 6d. each. Yet from "greys," "reins," or other faults, from sixty to seventy, and sometimes even two hundred out of every thousand, are rejected at proof. With the new punched steel barrels, which are at least one-half better than iron, and which can be profitably made at the same price, there are no defects whatever in the metal, since no defective ingot will withstand the punch. Messrs. Deakin & Johnson's process is equally adapted to the manufacture of hollow steel shafts for marine engines, railway axles, etc. A hollow axle thus punched and rolled, and 5½ inches in external diameter, has been tested upon three-feet supports, by a weight of 16 cwt. falling 25 feet, the blows beginning, however, with a 5-foot fall, rising progressively 5 feet at each blow. Under the highest fall, the axle was finally deflected 7½ inches, but no sign of fracture was shown.—*Engineering.*

MISCELLANEOUS SUMMARY.

It is stated, with how much truth we are unable to say, that an Austrian chemist, M. Leinelbrock, has discovered a method of inclosing electricity in small glass capsules which will explode under the influence of the slightest shock. The capsule, for the purposes of a projectile, is inclosed in a steel case, shot from a rifle, and when stopped by the body of a man will explode with sufficient force to kill. The statement appears to be somewhat "fishy." One would suppose that the shock of driving the projectile from a gun would be greater than that of being brought to a rest by the flesh of an animal. If the explosion took place anywhere it should be in the gun barrel.

A PRACTICAL saw maker of San Francisco has solved the difficulty of sawing a section of the big tree in Calaveras county to send to the Paris Exhibition. By his plan, two cuts are to be made on the tree, three feet apart, as deep as the saw will allow; the wood between the cuts being split out by wedges, angles are left which can be sawed and wedged as before. By the labor of two men the section can be ready for transportation within a month's time. The whole expense need not exceed five hundred dollars.

THE cost of living in New York at the present time is almost incredible, and it is astonishing where all the money comes from to support such extravagance. Furnished houses in fashionable avenues rent for $1,000 per month. A family living at one of our large hotels pay $700 per week for rooms and board. The average price for large rooms and board in the principal hotels cannot be less than $150 per week.

THE manufacture of the wire for the Atlantic cable kept two hundred and fifty hands employed for eleven months, supplying over thirty thousand miles.

To fix labels on tin, use French polish, or a solution of shellac in naphtha or alcohol.

THE *Journal of Applied Chemistry* gives the following recipes in reply to correspondents:—

To detect copper in pickles, put some of the pickle, cut small, into a vial with 2 or 3 drs. of liquid ammonia, diluted with one-half the quantity of water. Shake the vial; when, if the most minute portion of copper be present, the liquid will assume a fine blue color. Or immerse a polished knife blade; the copper will deposit upon it.

To remove fruit stains from napkins, etc., let the spotted part of the cloth imbibe a little water without dipping, and hold the part over a lighted common brimstone match at a proper distance. The sulphurous acid gas which is discharged soon causes the spots to disappear. Or, wet the spot with chlorine water.

THE big Horsfall gun, which was built at the Mersey Steel and Iron Works in 1856, and presented to the British Government, is to be mounted at Tilbury Fort, to command the mouth of the Thames. It was a solid forging of wrought-iron, bored out. The dimensions are: length, 15 feet 10 inches; diameter at the breech, 3 feet 7 inches; diameter of bore, 13·014 inches; weight, 53,846 pounds. The trunnions are forged on a separate ring, which is secured to the gun by a key.

COLT'S Works in Hartford, Conn., have contracted with the Government for the manufacture of one hundred of the Gatling guns. This gun is made of two sizes, one about that of the ordinary rifled firearm, and the other carrying a ball about one pound in weight. It is a revolving piece of six barrels, and proved in the late Government experiments to be the most destructive engine of war at moderate ranges hitherto employed.

WE have always maintained that the taxation necessary to pay the current expenses of the Government and the interest of the public debt should be raised upon articles of luxury, and that all necessary articles of consumption should be exempt so far as possible. Hence we are pleased to chronicle the fact that a large tobacco establishment of this city paid the enormous tax of $1,200,000 on their business during the past year.

PROF. PLAYFAIR, at the meeting of the British Association, stated that at the Riddings Colliery, there was a furnace 40 or 50 years old, the walls of which he found to be lined with plumbago three or four inches thick, which he attributed to the operation of the heat on the iron, but could not fully explain the mystery.

AN express train carried the twenty millions of thalers which form the war indemnity Austria must pay Prussia. The whole amount was paid in silver. It was loaded by the tun and took twenty men six days to count it. Ten clerks, twelve tellers, and thirty-six gendarmes accompanied the train.

THOMPSON'S CONNECTING LINK.—In No. 9, on page 142, current volume, is an engraving of Thompson's Link, the description of which speaks of it as cast iron instead of malleable iron. These links are made of malleable cast iron or forged wrought iron.

SIR ISAAC NEWTON is said to have worn in his finger ring a loadstone weighing three grains, and capable of sustaining over two hundred and fifty times its own weight.

A NOVEL anchor was lately tested in Baltimore harbor, triangular in shape, having six flukes, working on pivots, and when one side is imbedded the upper part closes, thus, it is claimed, preventing foul ing.

THERE are 137,000 persons in Brooklyn who do business in New York. The difference between the number of people that reside in New York, and those doing business there, is 197,000.

A LETTER received in Boston says, Monsignon Columbo, the only living descendant of Christopher Columbus, intends visiting America next year.

THE quantity of glass necessary for the Exhibition Palace, in Paris, would cover twenty acres.

A PILL-BOX factory of Bristol, Vt., uses three hundred cords of birch wood per annum.

BLACK tea of fine quality flourishes remarkably well on the coast of Georgia.

SPECIMENS of salt from the Salt Mountains, in Nevada, have been received in Washington.

PERRY'S PATENT VENTILATING BOOT.

Half of the fatigue in walking, especially in warm weather, is occasioned by the heating of the feet, which, in the close boots and shoes we wear, are excluded from every particle of the air. There is no reason why the feet should not be allowed to share with the rest of the body the benefits of pure air. The want of ventilation of our extremities is also one provocative of disease, and renders the heated feet sometimes highly offensive. The object of the improvement herewith illustrated is to provide a proper ventilation of the feet and keep them cool in hot weather.

Fig. 1.

As will be seen, by adverting to Fig. 1, the inner sole is honeycombed with holes made by metallic eyelets to prevent them from becoming closed. The next sole is cut away longitudinally, leaving a channel which, at A, communicates with the external atmosphere by means of a curved, corrugated piece of sheet metal, B, that reaches from the eyelets, A, to the channel at the hollow of the foot. These eyelets, as may be seen in Fig. 3, are high enough to be,

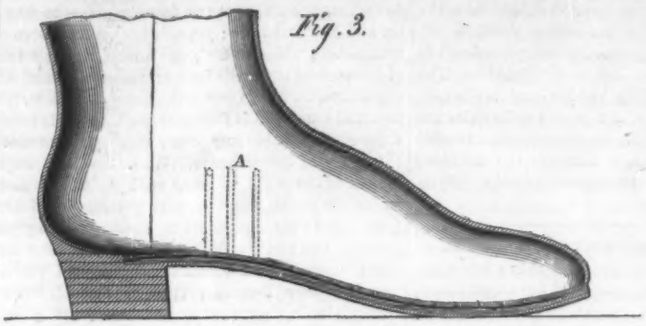
Fig. 2.

in ordinary weather, above the danger of admitting water, and being situated in the depression under the instep and on the inside of the foot, will not be exposed to the rain in a storm.

The longitudinal channel formed in the sole is covered by a strip of thin sheet steel, C, in Fig. 2, and over all is secured the firm outer sole in the usual way.

Evidently, in hot weather, and particularly on sun-scorched pavements, this will prove a comfortable improvement in walking gear. It was patented through the Scientific American Patent Agency Aug. 21, 1866, by Samuel Perry, of New York City, whom address for additional information at 219 Sixth Ave.

Fig. 3.



The Paris Universal Exposition.

The State Department has published a third supplemental circular respecting the Paris Universal Exposition, from which it appears that Belgium, France, Italy and Switzerland have, by a monetary convention, united to regulate the weight, title, form and circulation of their gold and silver coins. This arrangement is for the purpose of remedying the inconvenience to trade between the respective countries, resulting from the diversity of their small silver coins, and to contribute to the uniformity of weights, measures and coins.

Mr. Beckwith, United States Commissioner General to the Paris Exposition, says, in a letter to the State Department: The metallic standards both of the gold and silver coin of the United States, are now in harmony with those of the four countries named; and the standards being in harmony and the system all decimalized, it only remains to harmonize the coin in order to produce a reciprocal circulation. For this purpose a common unit does not appear to me to be necessary. However numerous the systems, if the standards are equal, and the system decimalized, it is only necessary that the unit of each be capable of expression in the multiples or sub-multiples of the others to produce the uniformity of coinage requisite for reciprocal circulation."

Convention of the American Social Science Association.

The second annual meeting of this Association was held in New Haven on Tuesday and Wednesday, the 9th and 10th inst. In his opening address the President stated the society to have been modeled after the National Association of Great Britain, and like that Society divides the study of the improvement of society into the four sections of Education; Public Health; Economy, Trade and Finance, and Jurisprudence or the Amendment of the Laws.

The opening paper was read by the Rev. C. F. Barnard, of Boston, on "early training as a means of preventing pauperism and crime." Mr. Clarence Cook followed with an article on the "application of design to American manufactures," advocating the education of the common workmen, so as to be able to participate in the feeling and knowledge of art in their respective fields of labor. The necessity for a more practical system, to supersede the present education of women, was presented by Mr. Hartley, of New York, followed by Mr. Jarvis, of Dorchester, and the Vice President. A long and interesting discussion was drawn forth by the labor question. Prof. Perry, of Williams College, spoke at some length, opposing the eight-hour system as tending to the antagonism of capital and labor. The co-operative system, now in operation in some parts of England, whereby the emloyés participate in the profits, though greatly benefiting the laboring classes of Great Britain, was not adapted to our own country.

The evening session was occupied by Judge Washburne, of Massachusetts, on the relations of common law and statute law; Dr. E. C. Wise, Secretary of the New York Prison Association, on the contract system of prison labor, and by the Hon. David A. Wells, Commissioner of Internal Revenue, on the subject of the wages of labor, affirming that the great advance during the past two years was having a disastrous effect on the interests of the country, by sending work abroad. The discussion of Mr. Wells's remarks occupied the remainder of the evening session.

The proceedings of the second day opened with a paper by Dr. Read, city physician of Boston, on cholera, and the means for its prevention, showing that its spread might be prevented, and its isolation secured by a strict system of quarantine, and urging the co-operation of the United States and British Provinces, so that the entire sea coast could be guarded and made secure.

"The connection of food with, and the responsibility of housekeepers for, the life and health of a family,' was presented by Dr. Jarvis, in a short but interesting paper. The Secretary, Mr. Sanborne, read a carefully prepared article on the education of deaf mutes according to the system of Dr. Blanchet, of Paris. This was a comparison between the system of articulation, and that of gesticulation. The speaker preferred the former, and proceeded to give some interesting details of the results achieved in France and Germany, and advocated the education of deaf mutes with other children, maintaining that in this way they could be brought to speak. This view was earnestly opposed by Mr. Stone, of the Hartford Asylum, Professor Day, and Dr. Gallaudet, President of the National Deaf Mute College, Washington, D. C., all of whom regarded Dr. Blanchet's system of articulation with disfavor, and eulogizing the American plan of instruction by means of signs as unsurpassed in any country.

Hon. David A. Wilder, of Boston, made a statement on the subject of tenement houses, favoring the erection of octagonal buildings, as a system of such would require a less amount of material for the same amount of room, and claiming for his plan, on the score of economy, lighting, heating and ventilating, the perfection of a tenement house.

The principal topics of discussion have been thus briefly enumerated. We regret that space will not allow us to dwell at greater length, nor to reproduce the very many valuable thoughts and suggestions presented at the Convention, some of which were of great practical importance.

In closing, resolutions were adopted, thanking the citizens of Connecticut and the Common Council and city authorities of New Haven for courtesies extended, also sending greeting to the British Association for the Promotion of Social Science, which closed its proceedings at Manchester on the same day.

Letter from A "Reb."

One of our old subscribers in Texas writes to renew his subscription and says:—I will try one dollar's worth, and if I find that the SCIENTIFIC AMERICAN has returned to the old land marks, that is, no politics, no sectionalism, I will return to my place in the ranks of your constant subscribers.

I have not seen the SCIENTIFIC AMERICAN since my time was out, in 1861, but others have told me that you were awful on the "Rebs" during the war, for which I have no ill feeling against you now. But as a "Reb," my back is very sore from the thrashing we have had, and while it is sore I do not wish to place it under the lash of an editor. But my good opinion of you leads me to believe that, now that the excitement is over, and the war at an end, I shall get the good old SCIENTIFIC AMERICAN again. Please excuse my rough remarks, I am now in a very good humor and only lack the good old paper to throw me into ecstasies. I have not yet abandoned those two inventions you encouraged me in—the cotton picker and the caloric engine—and if fortune smiles on me you may hear from me again on their case. With many regrets for the past and hopes for the future, I subscribe myself the old friend of the SCIENTIFIC AMERICAN. M. B. R.

Persistence of the Different Colors on the Retina.

Light has been hitherto considered as divisible only into the various colored rays by single, and into polarized rays, by double refraction; a new distinction has been discovered, founded on the varied persistence of the impressions made by the different rays on the retina.

It has long been known that the impression made by light does not cease with the cause that produces it. And it has been found that luminous impressions repeated at intervals of time appear to the eye continuous. It is on account of such apparent continuity, that a stick lighted at one end and made to revolve rapidly round the other as a center, seems to describe a circle of fire. The apparent continuity of sensations which are in reality intermitting, is not confined to those connected with vision; sounds repeated at very short intervals appear to be uninterrupted. In fact, every sound, however sharp, is but a series of different vibrations.

The consideration of these facts leads to practical conclusions. If, in ornamentation and music, the sensation of a second color, or sound, may be produced before that of the first has disappeared, the co-existence of colors or sounds, which are primarily intended to act only in succession, must be kept in view; and the sound or the colors must be such as to produce in the one case musical, and in the other pictorial harmony.

M. Laborde has lately communicated to the Academy of Sciences researches on this subject in connection with colors; and the conclusions to which they lead are very curious. He has found that the retina decomposes the rays of light in a manner different from that either of the prism or the double-refracting crystal. These disperse the rays with reference to different points of space, the retina disperses them with reference to different points of time.

In the experiments which were made, the light of the sun was received on a mirror which reflected it horizontally through a chink formed in the shutter of a darkened chamber. This chink was about the tenth of an inch wide, and the fifth of an inch high. Very near it, and within the chamber, was placed a metallic disk, around the edge of which were formed openings corresponding with, and of nearly the same dimensions as that in the darkened chamber. These openings were at considerable intervals; the disk was made to revolve by clockwork; and a means by which the operator, though at a distance, could moderate, accelerate, or arrest the revolution of the disk, was provided. Across the path of the luminous ray, and at the distance of about three feet, was fixed a plate of roughened glass, behind which the experimentalist observed the modifications of the light. The disk being set in motion, the luminous ray reappeared at certain known intervals. When it was made to reappear slowly, it seemed of a uniform white color; but when it reappeared at shorter intervals the edges began to be colored; and as the velocity of rotation was increased, the image passed successively through the following tints—blue, green, rose-color, white, green, blue. After the latter blue no increase of velocity produced anything but white.

It thus appears that some of the colored rays cause a more lasting impression on the retina than others.—*The Scientific Review.*

The Channel Tunnel.

A writer in a late number of *Chambers's Journal* enumerates no less than eight different projects for uniting England and France by uninterrupted communication. The first was proposed by a Frenchman named Mathieu, at the commencement of the century. His was a tunnel for a line of diligences. A few years later the plan, which had been lost sight of in the hostilities between the two countries, was revived by MM. Franchot and De Mottray, who proposed a cast-iron tube on the bed of the sea. M. Payerne suggested an improvement in a tunnel of brick masonry and concrete. After the introduction of railways a French engineer named Favre, proposed a tunnel for steam carriages. Two Englishmen followed with a proposition for a triple tunnel. In 1857 Thomé de Gamond advocated a series of shafts, lighthouses, quays, etc., in connection with a tunnel. Five years ago, J. F Smith, an Englishman, planned a wrought-iron tube to be suspended by piers some forty feet beneath the surface, a gigantic Victoria or Britannia bridge, or tunnel, sub-aqueous. At present Mr. Hawkshaw, the eminent London engineer, is boring to ascertain the character of the strata beneath the channel, to demonstrate the feasibility of a tunnel; while Mr. Fowler, the engineer of the Metropolitan Underground Railway, of London, proposes immense ferry boats sufficient to take a whole train on board.

This last appears to be the most feasible and practicable scheme. The difficulties to be surmounted in the excavation of a tunnel, its cost, the danger of injury to the structure, and the popular opposition to travel by such a route, are obstacles which are almost insurmountable.

SCHNEIDER'S ARTIFICIAL LEG.

The casualties of the war have created a great demand for artificial limbs, which has directed invention toward their improvement. The annexed engraving gives a view of a light and apparently successful substitute for the natural leg where the amputation has been performed below the knee joint

The sheaths, A, envelop the leg and stump, and are secured by lacings or some equivalent device. Attached to their sides are supports of iron or steel, jointed at B, to give the proper movement at the knee. The lower supports are attached to the sides of a foot, C, having a swell to compare with that of the ankle joint on the natural limb. This foot is intended to be worn in a boot or shoe. The movements of the foot are governed by strips of shirred rubber, D, one attached to the instep and two others to the heel. They can be adjusted by means of buckles, as shown.

This improvement was patented by Jacob Schneider, Aug. 15, 1865. State and county rights and further particulars can be obtained by applying to Jacob Fricke, 110 East Pearl street, Cincinnati, Ohio.

J. NORTON writes to the editor of Saunders' *News Letter*, Dublin, Ireland, that he used an ogival-headed iron shot, in a trial at Woolwich Arsenal, more than thirty years ago, and the flat-headed steel shot at the same time. Specimens of these projectiles he deposited in the museum of the Royal United Service Institution. He says he cast iron shot in iron molds in 1826, thereby antedating Palliser twenty years.

THE British Admiralty have adopted zinc as a sheating for the bottoms of the new iron ships now building.

THE Census Bureau estimates the present population of this country at 35,000,000.

Correspondence

American Iron and Steel.

MESSRS. EDITORS:—I notice in your issue of Oct. 6th an article on "Steel from American Iron," ascribing the deficiency in quality of American steel to the quality of iron used. Of the Cranberry ore, of North Carolina and East Tennessee, you may have heard. This ore will make an iron as tough as the best Swede, but it is very far from market. In the good, slow, old State of North Carolina there are ores from which can be made an article of iron that may be converted into a steel as good as any English, and these ores are easily accessible. I have now in my possession samples of such ores, and will be pleased to give them to any one who may send their address to me. The wrought iron made from the ore in the ordinary Catalan forge, stood a test, in Washington City, of 72,000 lbs. to the cubic inch. The mine is located convenient to transportation, and one-third of the ore bed with 15,000 acres of well-timbered land, is offered for sale. My opinion is that the pig might easily be delivered in New York for $30 per tun, including all expenses.

Further east, on the Cape Fear River, is an immense deposit of iron ore, pronounced to be the largest east of the Missouri Iron Mountain. It was worked by two companies during the war; both making pig metal. It is immediately on the Cape Fear River, with two or three locations of great water power near it; navigation to Egypt, where connection by railroad to Fayetteville is perfect and cheap. The ore is specular oxide of iron.

One of the furnaces which worked this ore is worthy of mention from its peculiar construction. It was designed and constructed by two practical Scotch iron makers, part owners. The boshes were lined with agalmatolite, silicate of alumina, and were built up their hight of stone. Above was a mere pen of logs strongly dovetailed, the inner lining of the furnace brick, and between the logs brick clay was packed. This furnace cost about $100,000 in Confederate money, including houses, opening, canal boats, water wheel, etc. Its capacity was about four tuns a day. The iron was pronounced the best for car wheels ever obtained from American ore.

The other furnace was located twenty miles from the bed, was worked by steam power, but for some reason never made quite so good iron. It is still in operation. The first was burned after Lee's surrender.

H. E. C.

Preservation of Wood.

MESSRS. EDITORS:—I notice in your last paper that the remarks I furnished you have called forth a lengthy communication from a correspondent, who partially agrees with me concerning the effects of charring the wood, but feels himself justified—by reference to weighty authorities—in being skeptical as to my other assertions. I will not occupy your valuable space by controverting such authorities as Ure and others, but will endeavor to show your correspondent how he can convince himself, by experiment, of the fact that living organisms (fungi or animaculæ) are the originators of all fermentation and putrefaction, and that where these germs have been destroyed, and the access of fresh germs is shut off, no putrefaction or fermentation will take place.

Take two glass bottles and fill them partially with a fluid that will easily ferment or decompose, carefully cork each bottle and insert in each a glass tube about six inches long, drawn out to a point. Bring the contents of both bottles to the boiling point, and after the steam has blown off, close the tubes by a blow-pipe quickly.

Now, having hermetically sealed up your bottles, the fluid contained will remain good for any length of time, because, first, the germs are all destroyed, by boiling, and, secondly a vacuum has been formed. If, after some time, the glass tube is broken so as to admit a quantity of air as before, so that it may become thoroughly heated by slowly passing through the red-hot tube, close the opening and let this also remain for any length of time. On examina-

tion the contents of the first bottle will be found in a state of putrefaction and the microscope will reveal organic life, but no such change can be detected in the second.

Now, it is evident, that in the air which passed through the red hot tube, the vitality of the parasitic germs floating in the air were destroyed. The experiment thus proves incontestibly that these germs are absolutely necessary to give the first impulse to decomposition, also, that the rapidity is dependent on the quantity of germs present or introduced artificially, or the quantity of soluble albumen present and temperature. No germ is capable of retaining its vitality at the boiling heat of water, and where the albuminous substances have been coagulated or decomposed by a higher degree of heat, though not high enough to char the wood, the conditions for decay will be reduced to a minimum, and only a very long exposure to moisture will affect it, for the fiber is scarcely subject at all to decomposition unless in contact with decaying albuminoids. HENRY STURZ.

New York, Oct. 3, 1866.

A Universal Signal Code.

MESSRS. EDITORS:—In the SCIENTIFIC AMERICAN of September 1st, I had the honor to suggest a plan by which a simple system of signals could be obtained for general use. That article having attracted some attention, permit me to say a few words more on the same subject.

The plan proposed by Mr. J. Wyatt Reid, in your issue of September 8th, is, in my opinion, altogether too complicated for general use, however good it may be for the purpose for which it was originally intended. It requires four flags of different colors, a four-sheaved signal block and halliards, a flag-staff, and, in some instances, a dictionary. It might work well on shipboard or at permanent signal stations, but for adventurers, surveyors, builders, manufacturers, and others, it would be impracticable. What is wanted is a system of universal application, even if there are no flags or halliards within a thousand miles.

The plan proposed by Mr. Solon Robinson, in your issue of September 15th, is much better, but any one who has been connected with the Signal service would tell him that there is a much simpler method. Being compelled by an oath of secrecy to abstain from any explanations concerning how this is accomplished, I am anxious that the Government should confer a favor on the nation and the world by making public a code for general use. By means of a general dictionary containing the ordinary words of all languages this code could be made an international one.

Permit me to suggest, in addition, that the proposed system is entirely practicable, having been used during the late war with perfect success, and having been the subject of the praise of every General and Admiral in the United States service.

GEO. C. ROUND.

Binghamton, N. Y., Oct. 3, 1866.

[Probably the Government could, without detriment to its own interests, make public a system by which communication could be maintained between parties separated by distance, as a system of ciphers could be readily adapted for secret service. It seems as though a plan of this sort might be rendered useful and of great benefit in case of shipwreck, and in other situations where human life or property might be in danger.—EDS.

A New Way of Cutting Glass.

MESSRS. EDITORS:—It frequently happens that chemists and others wish to utilize some bottle or piece of broken glass apparatus, by cutting it in a certain manner. As some persons experience great difficulties in doing this, I will communicate to you, for the benefit of such, a very simple means by which glass can be easily cut in any direction.

Take of powdered gum tragacanth, one-eighth of an ounce, dissolve it in sufficient water to form a middling-thick paste, then dissolve one-fourth of an ounce of finely-powdered gum benzoin in the least possible quantity of strong alcohol; mix both solutions thoroughly and add to this a sufficient quantity of finely-powdered beech-wood charcoal to form a doughy mass a little thinner than pill compositions. Out of the above mass roll little sticks about four inches long and three lines thick, and let them dry spontaneously. If, after being thoroughly dried, one of these sticks is ignited, it burns to a fine point until it is entirely consumed.

The glass to be cut is first scratched deeply with a diamond, then one of the above sticks is ignited and held, with a very slight pressure, on the crack, in the direction the cut is to proceed, and it will be found that the cut will follow in any direction the "taper" may be drawn. The taper must be withdrawn every few seconds and brought to a more lively burn by brisk blowing, as it is cooled by the contact of the glass.

This method is very successful. I have cut "spirals" two-thirds of a line in width, out of thin glass tubes, by this process. Lamp chimneys having cracks may be thus cut with rapidity and ease.

V. G. B.

Brooklyn, N. Y., Oct. 8, 1866.

Shot Guns.

MESSRS. EDITORS:—Your correspondent "J. Richards," of Ohio, wants to know "what will make a gun shoot close." I can tell him: Clean the muzzle inside down a quarter of an inch or more, then warm it over an alcohol lamp, and with a tinman's soldering iron and fluid, tin over the inside to the thickness of thin card paper. Trim it out smooth, leaving it of equal thickness all round, and he will be astonished at the improved shooting of his scattering gun. I have found, by experimenting, that the shooting qualities of a gun are mainly in the muzzle, and there perfection is wanted. I claim the above as my invention, though I never have asked for a patent. A gun treated in this way will not only shoot close, but will drive the shot with much greater force. S. M. BLAKE.

Bellows Falls, Vt.

EXPERIMENTS IN RAISING VESSELS.

[From our Foreign Correspondent.

MESSRS. EDITORS:—Not long since an important trial was made of an apparatus invented by M. Eyber, a Prussian engineer, designed for raising sunken vessels. The general appearance of the machine is that of an elongated ellipsoid, thirty feet in length by twelve feet high, covered with a waterproof pliant fabric, a square centimeter of which will sustain a tension of one thousand pounds. Around the whole structure is stretched a cord net, the ends of which are to be attached to the wreck. By this means the weight—which may amount to more than one hundred tuns—is distributed equally over the whole surface of the apparatus.

From official sources, we are safe in estimating the average number of trading vessels annually lost upon our coasts as high as fifteen hundred. The ocean has thus become literally paved with numberless fleets, lying for the most part not far from land, in comparatively shallow water. Independently of the cargoes, the recovery of the wrecks alone is an important work, for being usually imbedded in the mud, the wood-work remains uninjured by the sea worm, and the iron work suffers but little from rust or other causes. For recovering these sunken vessels hydraulic cranes, placed on rafts, are often employed, but the power furnished by any single crane would be quite insufficient for raising a small packet-boat weighing but 800,000 pounds, while the use of a system of cranes is not possible, for the least rough sea would destroy the whole structure. Chaplets formed of casks are also impracticable, for in such a system if a single cask is broken by the waves the equilibrium of the whole is destroyed, and the wreck, even if partly raised, will be again lost.

India-rubber bags have been tried and failed as did the casks; they are too lightly constructed; moreover, the cloth can never furnish sufficient resistance to the weight of the water, for if inflated when at a great depth, then re-ascending, the inside pressure will prove greater than the outside, and the bag will burst in consequence.

The use of iron boxes and, indeed, many other methods, have been resorted to, but for one reason or another they have failed in satisfactorily accomplishing the object sought.

After many years of study and investigation, M. Eyber has invented this submarine machine for raising vessels, pronounced by competent authorities in every way superior to any mode now in existence. The funds necessary for building the first *Narwal*, as the inventor has named it, were furnished by the Imperial Administration, the general Transatlantic Company, and a committee from the maritime insurance companies. The Emperor has granted M. Eyber an audience, and has also shown him special marks of favor.

The trial trip for testing the value of the invention took place as above, on Cazaux lake, in the presence of the Prefect of Puy de Dome, the Sous Prefect of Riom, the Commanding General, other civil military and naval officers, and a large concourse of people. The experiments were perfectly successful, the *Narwal* rising gracefully to the surface of the lake having attached an immense boulder weighing sixty tuns.

The Government was represented at this trial by a naval engineer, M. Lisbonne, sent by the Minister de la Marine. In his official report he speaks thus favorably of the working of the apparatus: The "results of the experiments made on Cazaux lake, prove the machine of M. Eyber in every way superior to any that have hitherto been devised.

The use of an elastic air and water-tight fabric, is peculiarly adapted for submarine apparatus. The regularity and easy working of the machine, and above all the immense power it is capable of exerting, have been demonstrated in these experiments, but so far as relates to the raising of vessels, actual trial alone can testify. C. D.

Paris, Sept. 18, 1866.

Notes and Queries

T. J. M., of Minn.—On account of the convexity of the earth, seven or eight inches of the lower part of an object is concealed from an eye at the distance of a mile, and looking from the surface. But it does not follow that at ten miles only seventy inches would be concealed. We refer you to the properties of secants in trigonometry.

M. M. B., of Del.—The method of finding the hight which a ball fired upward will reach is very simple. You only need to know the number of seconds of interval between the firing and reaching the ground again. Multiply the square of half the number by 16. Thus, if the interval be 10 seconds, the hight was

5^2 or $25 \times 16 = 400$ feet.

W. L. F., of Ill.—Iron to be coppered by the battery should be cleaned with very great care. If the work is important it is well to give it a preliminary coat of pure iron by the battery; this last is almost indispensable for cast-iron work. The coppering solution for iron is cyanide of copper dissolved in cyanide of potassium. After the object is covered, the coating is thickened in the ordinary sulphate of copper solution.

J. B. E., of N. Y.—A varnish made of Canada balsam is an excellent transfer varnish, equally effective on glass and other surfaces.

E. H. L., of Ohio.—Kinkel and Hubbe's propeller is in principle nearly the same as the well known Barker mill and therefore does not require a lengthy discussion in this paper.

W. D. A., of N. Y.—We are not aware that any thing further than what you refer to has been published on the new bleaching process. You can procure the chemicals from any of our wholesale druggists.

J. B. F., of Conn.—To make permanganate of potash, take 10 parts caustic potash, 8 parts peroxide of manganese, and 7 parts chlorate of potash. Dissolve the soda in the smallest quantity of water, then add and triturate the other ingredients; evaporate to dryness; ignite at a low red heat, when cold dissolve in water, and you have a solution of permanganate of potash. To make permanganate of soda use caustic soda and chlorate of soda instead of potash and chlorate of potash in the above formula.

G. A. of Ill.—Receipt for black ink, 12 oz. bruised galls, 1 gallon cold water; after digesting a day or two, add 6 oz. copperas and 6 oz. gum arabic, and a few drops of creosote or oil of cloves. Let soak with occasional rousing up for two or three weeks, then strain from the sediment.

G. H. S., of Mass.—If the mold in which you cast your bronze is too tight, the result will be a porous casting. It should be permeable to the gases generated by the contact of the metal with the sand, or they will be confined and "blow" the casting. Possibly you use too much loam and not enough of sand in the composition of your molds. Perhaps your metal is not poured at the right temperature. When the zinc gives off a flame from the top of the crucible, the metal should be poured.

W. R., of N. Y.—The horse-power of stationary and portable engines is the same in this country and England, and is used to denote the estimated working capacity of the engines.

NEW INVENTIONS.

The following are some of the most prominent of the patents issued this week, with the names of the patentees :—

CARBURETING APPARATUS.—JAMES MCGEARY, Salem, Mass.—This invention relates to an apparatus or attachment for pipes used for conducting gas, more particularly the object of which is to increase the illuminating power and quality of the gas, as it passes through to be burned or consumed.

GATE HINGE.—L. E. WOODWARD, Cohocton, N. Y.—This invention consists in elongating the eye or pintle hole of a gate, hung in such a manner that it will allow the eye a longitudinal play upon the pintle, whereby the forward end of the gate may be raised and lowered for opening and closing it, thus dispensing with the use of latches and the like—a rigid catch being used, as well as preventing all sagging of the gate upon its hinges when it is closed.

GARDEN CULTIVATOR.—JOEL A. HALL, Columbus, Ohio.—This invention consists in so constructing a machine that any kind of grain may be sown in drills in any desired quantity. The machine is also provided with cultivator teeth or shovels of any desired form for covering the grain or eradicating the weeds and loosening up the ground.

GANG AND SUB-SOIL PLOW.—R. L. DODGE and E. M. WALKER, Gallatin, Mo.—This invention consists in constructing a gang of plows and arranging them in beams, and attaching them to a frame in such a manner that they may be either used for surface plows or for sub-soiling.

WOOL TYER.—O. C. MCCUNE, Darby Creek, Ohio.—The object of this invention is to provide in a cheap and simple manner, a device by which the fleeces of wool after it is shorn may be closely pressed and tied in a small space, and consists in the employment of levers in combination with a strap and covered teeth, in such a manner that the fleece of wool is acted upon by a rolling pressure and brought into a very small compass and held until tied by cords, when it can be instantly released from the pressure and removed from the machine.

PLOW.—CARLISLE ST. JOHN, Keosauqua, Iowa.—The invention consists in constructing the land side and colter of a plow both of the same piece in such a form that a good cutter is made and also the land side of a plow.

APPARATUS FOR DISTILLING.—C. H. HALL and JOHN ELLIS, New York City.—This apparatus is designed particularly for distilling or refining petroleum oil, but may be employed in the distillation of turpentine and volatile oils of any other description, and it is so arranged that a continuous distillation can be effected with little trouble and expense.

STOP COCK.—B. E. LEHMAN, Bethlehem, Pa.—This invention relates to a stop cock, the plug of which is open at the bottom and fitted into a case which is closed at the bottom and provided with a stuffing box on top, so as to hold the plug down in its seat and prevent the escape of steam or liquid. The liquid or condensed water accumulating in the case and plug, is drawn off through suitable waste valves, one in the bottom of the case and the other in the top end of the plug, in such a manner that in cold weather the stop cock sustains no damage by the freezing of said water or other liquid.

REMOVING THE FASTENING ON CORKS OF BOTTLES.—JAMES S. HAZARD, Newport, R. I.—This implement consists of a fork-shaped arm by which it is placed upon the neck of a bottle, in combination with a hook lever so hung to said arm that when the latter is over and upon the neck of the bottle it can be engaged with the loop fastener for the cork, which, by then properly operating it can be swung away from the top of the cork, leaving it free to be removed.

EGG BEATER.—CHAS. PINDER, Lowell, Mass.—This invention consists in providing a cover which fits tightly into a metallic can, which latter is the receptacle for the unbeaten eggs, with a number of hoops or arms extending downward into the can, and crossed or united so as to retain their proper position. By shaking to and fro this device the eggs will be dashed against the hoops or arms and thoroughly reduced to a froth in a very short time.

MACHINE FOR PEELING WILLOW.—GEORGE S. ANDERSON, Jeffersonville, Ind.—By this machine willow can be peeled in a most expeditious and practical manner, and without injuring it in the least.

TURNING IRREGULAR FORMS.—J. E. F. LELAND, New York City.—In this machine the material to be turned is suspended upon centers of a carriage arranged to slide in a suitable way or groove of the bed piece of the machine, in combination with which carriage one or more cutters are so arranged and operated that, as the material is carried along to the said cutters they will be made to so act upon the material as to produce the form desired.

REVOLVING HAND HAY RAKE.—RALPH G. LAMSON, Brownsville, Vt.—This invention has for its object to furnish an improved revolving hand hay rake by means of which hay may be raked by hand easily, quickly, and cleanly.

HYDROMETER.—G. TAGLIABUE, New York City.—This invention consists in a hydrometer which has a lump of metal or other suitable material secured in its main bulb in such a manner that said lump will firmly adhere to the inner surface of the glass, and the secondary bulb used in ordinary hydrometers for the purpose of holding shot or mercury can be dispensed with. The length of the bulb is thereby materially diminished, and an additional space is obtained for the scale without increasing the aggregate length of the instrument.

DROP PRESS.—JOSEPH P. NOYES, Binghamton, N. Y.—This invention relates to a drop press the hammer of which is guided between two uprights and suspended by a belt from a crank mounted on the end of a shaft on which revolves loosely a hollow drum. This drum is rendered rigid with said shaft by the action of a lever catch and shoe which are arranged in the interior of the same, the shoe being connected by a link with an arm extending from the shaft and the lever catch with the shoe by a pivot in such a manner that when the drum turns in one direction the lever catch and shoe will bind on its inner surface and render the same rigid with the shaft, causing the hammer to rise by the action of the crank until it passes its upper center. At that point the outer end of the lever catch comes in contact with a spring stop, and the drum is released, allowing it to revolve independent of the shaft, and by pulling the spring stop the shaft is freed and the hammer drops. As the hammer rebounds, the lever catch and shoe immediately bind in the drum and the hammer begins to rise, and a drop press is obtained which can be operated with great convenience.

SHAKING TABLE.—WM. B. FRUE, Houghton, Mich.—This invention relates to a shaking table, the top of which is made undulating, or so that it forms a series of concave troughs in which the ore lodges and which are provided with projecting points or teeth, and with discharge channels in such a manner that by the motion imparted to the table and by the action of the projecting teeth the ore is thoroughly agitated and the heavy parts are made to pass through the discharge channels, while the waste is thrown off over the lowest end of each of the concave troughs. The motion imparted to the top of this shaking table is triple, and thereby the separation of the ore is materially facilitated.

SAFETY VALVE FOR STEAM BOILERS.—H. ANDERSON, Chicago, Ill.—This invention relates to a safety valve which is held in position by a volute or other spring placed in the interior of the boiler, said valve being provided with a stem which extends through a socket in a bridge on the inner surface of the dome cover, in such a manner that the valve operates free and easy, and the spring which holds the same in position is out of reach of the engineer or person in attendance, and can not be tampered with.

INK-WELL COVER.—GEORGE MUNGER, New York City.—This invention relates particularly to the manner in which the hinge joints of ink-well covers are constructed, rendering the same cheap in their construction, and easily put on or taken off.

MACHINE FOR BENDING WOOD.—CHARLES MOYER, Coopersburg, Pa.—This invention is particularly intended for bending sleigh runners, but which can also be used for bending strips of wood for other purposes. The strip to be bent is secured to a former by means of a flexible metal strap, and said strap is provided with a link through which the end of the strip of wood is passed, so that the same can be conveniently bent to the required form, without over-straining the strap and with comparatively little power.

PISTON PACKING.—JAMES BROUGHTON, Lambertville, N. J.—This invention relates to a piston which is provided with two sets of packing rings separated from each other by a partition plate, and each provided with a separate steam channel and with a separate set of springs. The steam channels are formed in the outer portions of T-shaped keys inserted behind the joints of the packing rings, and through those channels steam is admitted behind the rings, the division plate preventing said steam from passing around to the exhaust side of the piston.

SASH SUPPORTER.—WILLIAM S. VAN HORZEN, Saugerties, N. Y.—This neat little invention consists of a simple arrangement of a rubber roller moving freely in an inclined recess. The sash being raised to any hight, the pressure of the roller prevents it from falling till its motion is confined by a loose bolt, then the window can be lowered. As a sash supporter and lock, it is one of the simplest of its class. Patented September 25, 1866.

DEVICE FOR LOWERING BOATS.—H. GOULDING, Worcester, Mass.—This invention relates to an apparatus which, when attached to the fore and aft ends of a boat, will enable it to be hoisted up and lowered down to the side of a ship, and to be let into the water, with both its ends at the same time.

STOVE FOR DENTISTS.—S. P. HILDRETH, Mount Vernon, Ohio.—This invention has for its object the furnishing a stove for the use of dentists, for packing rubber, vulcanizing, etc., and it consists in combining a jacket for holding the vulcanizing flask with a stove.

PLANT TRANSPLANTER.—W. C. S. ELLERBE, Camden, S. C.—This invention is designed to furnish an instrument by means of which all kinds of plants, such as corn, cotton, etc., can be transplanted without injury to the plant or checking its growth, the position of the fibrous roots in the soil not being disturbed.

CARPENTER'S BENCH.—ROBERT MCCONNELL, Lawrenceville, Pa.—This invention is designed to furnish an improved carpenter's bench, the vise of which is so constructed and arranged that the jaw can be adjusted, and the article to be held secured between the jaw and the bench instantaneously.

SAW HANDLE.—N. HOMES, Leora, N. Y.—This invention is a neat, convenient and substantial handle for cross-cut saws, which may be readily attached to and removed from the saw, and which may be used as a saw set or a wrench, as occasion may require.

ANIMAL TRAP.—JOHN W. HOLLINGSWORTH, Seymour, Ind.—This invention has for its object to furnish an improved animal trap, simple in construction, efficient in operation, and not liable to get out of order.

HINGE AND PIN FOR IRON MOLDER'S FLASKS.—E. C. LITTLE, St. Louis, Mo.—This invention relates to an improved mode of making and fastening hinged and pins for the cope and drage of iron molder's flasks, the object and advantages of which are that they secure and strengthen the corners of the flask better than the old style of hinges and pins and ordinary methods of attachment, and are not so liable to become deranged and thrown out of match by the shrinkage and springing of the wood of the flasks.

CORN PLANTER.—CARLISLE C. MYERS, Sterling, Ill.—This invention relates to a corn planter of that class commonly termed self-dropping, and it consists in a novel seed-dropping mechanism whereby the corn may be planted in check rows without the necessity of previously furrowing the ground in one direction.

HANGING GATES AND DOORS.—GEORGE W. HOLLY, Low Moor, Iowa.—This invention consists in hanging a gate or door by means of pivoted bars and guides in connection with braces, all being arranged in such a manner that the gate or door may slide, and open and close freely.

MORTISING MACHINE.—WALTER NAUGEL, Philadelphia, Pa.—This invention consists in an improved means for operating the rotary reciprocating cutter, and also for operating and adjusting the bed to which the stuff to be mortised is attached, whereby several advantages are obtained over the original machine.

APPLICATION OF PETROLEUM AS A FUEL.—E. MCKINNEY, Clarksville, Tenn.—This invention relates to an improved means of feeding petroleum to stoves, furnaces, etc., to serve as a fuel. It consists in the employment of water or other fluid having a greater specific gravity than the petroleum, and placing the former in an elevated tank or reservoir communicating with the lower part of the petroleum chamber by means of a pipe, so that the petroleum will be fed to the fire pan or chamber by static pressure.

VENTILATING VAULT-LIGHT COVER.—MICHAEL J. MCCORMICK, New York City.—This invention relates to an improvement in vault-light covers, whereby ventilation is obtained without removing the cover from its plate or bed.

BEEHIVE.—W. H. PIERSON, West Jersey, Ill.—This invention relates to the breeding and spare-honey boxes, whereby the labor of the bees is materially reduced; also relates to an improved means for transferring the bees from one honey box to the other in order to admit of old combs being taken out when necessary, and to an improved robber trap, whereby the honey in the hive is fully guarded and protected from robber bees.

LOCK.—WILLIAM SELLERS, New York City.—This invention relates to an improved lock of that class which are designed for articles having hinged or rising and falling lids, covers or tops, such, for instance, as piano-fortes, sewing-machine cases, etc.

COMBINATION SEAT AND DESK.—DAVID I. STAGG, New York City.—This invention is a combination of a seat and desk, whereby the device may be adjusted to serve as a seat only, or adjusted to serve as a seat and desk for either adults or children. The invention is more especially designed for public schools where the rooms provided with desks and seats are frequently used for lectures, addresses, etc., and where seats for adults are required; the invention admitting of rows of desks and seats being converted into seats by a very simple adjustment.

HAY-LOADING MACHINE.—G. W. FOREST, Evansburgh, Pa.—This invention consists in a means for rendering the hay carrier operative and inoperative when desired, and also in a means for elevating the carrier to any desired degree of inclination within the scope of its movement, to conform to the load as the same increases in hight.

WATER ELEVATOR.—A. O. REMMINGTON and R. STEWART, Weedsport, N. Y.—This device is for elevating water for domestic purposes, and is composed of a bucket and windlass, the latter being provided with a bucket-releasing mechanism to admit of the empty bucket descending without the necessity of reversing the motion of the windlass.

RADIATING STOVE.—GEORGE D. GREENLEAF, Depauville, N. Y.—This invention relates to an improvement in flues and valves, or dampers, whereby the direction of the products of combustion may be controlled in such a manner as to cause a large volume of heat to be radiated from the stove, and at the same time a direct or a partially direct draft allowed, as may be required.

COAL-OIL LANTERN.—JOHN O. HARRIS, Reading, Pa.—This invention has for its object the construction of a lantern so that coal oil may be burned in it without emitting smoke and an unpleasant odor, and which will admit of being carried and swung around, and also raised and lowered suddenly, without extinguishing the light.

GRINDING MILL.—J. G. LANE, Washington, N. Y.—This invention relates to an improvement on the conical grinding mill, more generally employed for grinding coffee, spice, etc., and it consists in a simple modification of the grinding surfaces or plates, whereby the discharge of the substance being ground may be regulated as desired, and the substance ground to the required degree of fineness.

WOOD-SAWING MACHINE.—ISAAC ALLARD, Belfast, Maine.—In the machine embraced in this invention, simplicity in both the construction and arrangement of the parts and efficiency in its operation are obtained.

STOVE.—E. N. CUMMINGS, Colebrook, N. H.—The object of this invention is to improve heating stoves, and increase their radiating surfaces without enlarging their size or increasing their cost. It is adapted for wood or other fuel.

COMBINED CARPET STRETCHER AND TACK HOLDER.—FREDERICK ASHLEY, New York City.—This invention relates to a useful implement for the laying and tacking down of carpets, etc. It consists of a combined carpet stretcher and tack holder, by means of which the stretching and the tacking down of carpets, etc., can be accomplished with ease and dispatch, and with the utmost convenience.

MACHINE FOR WASHING DISHES.—JAMES J. SAWYER, Woodstock, Conn.—This machine consists of a receptacle for the water used, so formed as to receive and hold the dishes about its sides, leaving the central portion clear, where, by any suitable means, a dasher or beater is so manipulated as to throw and dash the water about and over the dishes for washing them.

TOOL FOR REMOVING BOILER TUBE.—F. RAMSEY and JAS. MILLER, New York City.—This implement is so constructed and arranged, that by placing it upon the inside of the boiler tube to be removed it can be brought to bear against and made to cut or sever the tube at any point of its length between the head plates of the boiler.

SHINGLE MACHINE.—A. M. CONNETT, Madison, Ind.—This invention was illustrated in SCIENTIFIC AMERICAN, No. 6, present volume.

SPECIAL NOTICES.

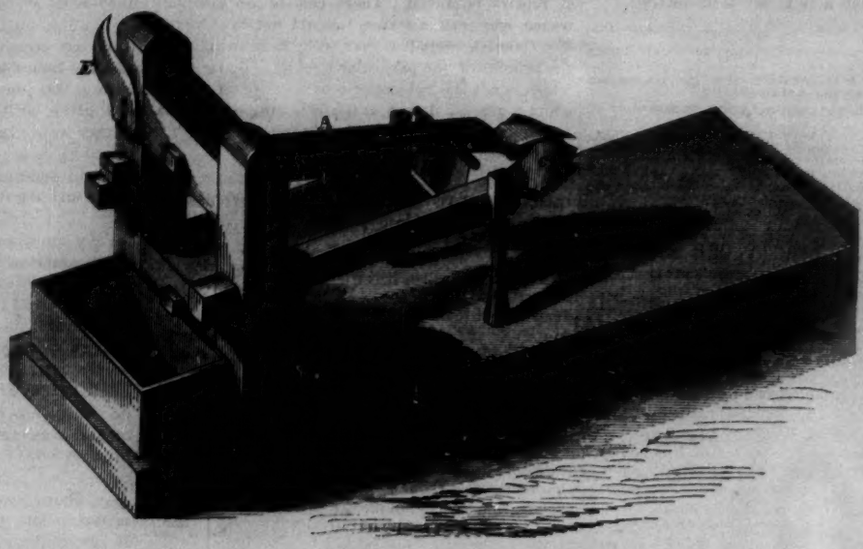
Pinckney Frost, of Springfield, Vermont, having petitioned for the extension of a patent granted to him the 11th day of January, 1853, and reissued the 9th day of February, 1856, for an improvement in scythe fastenings, for seven years from the expiration of said patent, which takes place on the 11th day of January, 1867, it is ordered that the said petition be heard at the Patent Office on Monday, the 24th day of December next.

RECEIPTS.—When money is paid at the office for subscriptions, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a *bona fide* acknowledgment of the reception of their funds.

Improved Cane Stripper.

This apparatus is designed to remove the leaves from sorghum cane preparatory to crushing it for the juice. The inventors say that two men can do twice as much work with it as they can in the ordinary way. It will strip cane after it has been cut three or four days, and works equally well on green or withered stalks. The caps are taken off without bruising the stalks, which is very desirable to sirup makers. When early frosts come on, the whole crop must be cut and laid in windrows; this machine can then be used to advantage, either where the crop is lying, or in the barn, as it is light and easily transported. All the tops and blades are left in one place, which is better than having them scattered over the field. The several parts are as follows:

Four elastic arms, A, secured to the frame, B, are provided with cutters, C, and a gate, D. When the gate is allowed to hang down, the arms are extended as shown, and the stalk is entered from the front. As it is drawn through, the gate is pushed out of the way and the arms close upon the stalk, when the leaves are immediately stripped off.—The heads of the cane are struck off on the knife, E, attached to the frame.



BISHOP & GLADDEN'S CANE STRIPPER.

This invention was patented through the Scientific American Patent Agency Oct. 10, 1865, by Bishop & Gladden of Chrome Hill, Md. For further information address patentees or John M. Griffith, 49 North Paca street, Baltimore, Md. County and State rights for sale.

Writing Ink.

The boasted power that has been proverbially ascribed to the pen, should, in fairness, be shared with its unpretending associate, whose presence constitutes its sole claim for notice, and deprived of which, its power vanishes. We may look in vain through the whole field of chemistry for any preparation that has so far benefited the civilized world, or whose use is so universal, as this same writing ink.

To fix a date for the introduction of ink would be impossible; its antiquity is only inferior to writing itself. We have early receipts for its manufacture, though the article seems to have been similar in composition to india ink, having a consistency much thicker than our writing fluids, from which cause the letters appear in relief, as if embossed.

During the middle ages fluid ink was used, and it is a fact not a little singular in this progressive age, that essentially the same constituents were then employed that are now made use of in some of our best inks. The truth of this assertion was proved, incidentally, a few years ago, while an examination was being made to ascertain the explanation for a fact often noticed by antiquarians, that while manuscripts of the fifth and sixth centuries now remain apparently as bright as when first written, those of comparatively recent date have often become almost illegible, and sometimes even obliterated. This superiority of the old over the new was then proved to be due entirely to the better preparation of the material upon which the writing was made, namely, parchment or vellum.

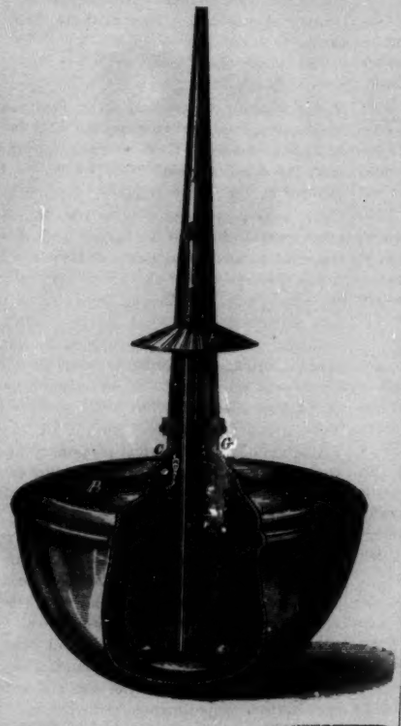
This question of durability is the one of greatest value in the selection of an ink. Although for many purposes the only requirement is that it will remain without fading for a few years, yet there is hardly a bottle sold some of which may not be used in the execution of documents, that may be required to be legible fifty or a hundred years hence.

In addition to innumerable methods invented from time to time for counteracting the effects of time, plans have also been proposed for guarding against removal for fraudulent purposes. Some time since an eminent chemist suggested a curious mode for not only preventing the actual removal by chemical means, but also for detecting any unsuccessful trials that may have been made. He proposed first dipping the paper on which the writing was to be made into a solution of gallic acid. Any attempt to efface a word written on paper thus prepared, by any of the usual chemical methods, would result in forming a black ring around the character, which it would be impossible to erase without destroying the paper.

The use of red ink is common in old manuscripts for the initial letters, also the titles of books, and headings of chapters. At Orleans, a charter of Philip I., of France, is preserved, dated 1090, which is written with green ink. Red, yellow, purple, and, indeed, any variety of colored inks may be easily produced, and have been used. In all these the coloring matter desired is held in suspension by thickening the liquid with gum-arabic.

Olmsted's Spring-Top Oiler.

It is frequently necessary to eject oil from an oiler when the implement cannot reach the part to be lubricated. This is done by a sudden compression of the air in the can, acting on the oil, which compression is produced by diminishing the oil space by springing the top or bottom of the oiler inward. Such is the oiler represented in the engraving.

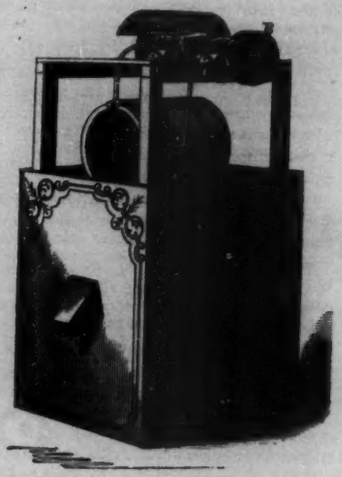


A is the body of the can, "struck up" from heavy sheet tin; B is the top, crowning at the center to allow free passage to the oil, and being a disk spring, which is operated by the collar, E, on the tube, D, that screws into the top, at C. To prevent the flexible top from being set, which is the main object of the improvement, a pipe, F, fits snugly into the discharge tube, having longitudinal slots in its sides to allow the oil to pass freely, and its other end engages the stud of the weight, H. The pipe, F, is soldered to the inside of the screw, G, making this, usually the weakest part of an oiler, the strongest, as after the pipe reaches the top of the weight, H, no further pressure on the cover can depress it.

This device was patented through the Scientific American Patent Agency, May 1, 1866, by L. H. Olmsted, Stamford, Conn., to whom apply for additional particulars.

Water Elevator.

Notwithstanding the conveniences of pumps, by which water can be brought directly into the house from a well situated at a distance, the popular idea on this subject is well expressed in the song of "The Old Oaken Bucket."



The engraving shows a well curb and water elevator, which is easily operated, and having no springs or other attachments liable to get out of order, is durable and convenient. The crank, A, has a cam at the end opposite the handle, which bears against the periphery of a wheel inclosed in the box, B, so that when rotated to raise the bucket, it gripes the wheel, which is a portion of the shaft carrying the rope wheel, and becomes a part of the shaft. To lower the bucket in the well, the arm of the crank is rested on one of the lugs, C, when the eccentric of the crank is released, and the drum allowed to revolve, sending the bucket down. The pressure on the crank can be regulated to permit the bucket to descend with greater or less velocity. A catch on the bucket rim engages a projection on the curb, tilting it for the delivery of the water when at the proper hight.

Patented through the Scientific American Patent Agency Sept. 4, 1866, by Alfred Woodworth.

For further particulars address Alfred Woodworth, Cambridge, or North White Creek, N. Y

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A SYSTEM OF GAGES FOR IRON WORK.

The gas-fitters of this country and Europe, or, at least, England, agree on a system of threads for various sizes of pipes. If a gas-man is told the size of a gas or steam pipe, he knows the number of screw threads to the inch that is employed to fit that particular size. To be sure, the graduations of the threads might have been on a scale more easily followed than that now in use. But the system has, with its imperfections, such an advantage as to commend itself to mechanics generally.

In establishments of any considerable importance, a perfect system of gages for screw threads, gradations of drills, and of arbors, as well as of other measurements, is adopted and steadily followed. They may not, and rarely do, coincide with those adopted by other concerns. Indeed, some establishments have purposely adopted for their bolts, screws, and nuts, fractional threads, which cannot be easily mated otherwheres. Their object was to compel the owners of their tools or machines to return to them for parts or repairing. This sort of management was very short-sighted. For a time it might be profitable, but eventually those who were thus restricted, hampered, and embarrassed, ceased to patronize so selfish a policy, and induced others to follow their example.

If interchangeable parts are an advantage in the works of a single concern—if a uniform system of gages is profitable to the purchasers of one machine—why may not the same systems be of much greater benefit universally, or generally applied?

Our mechanics depend upon the public for support. Their work is intended to benefit generally the people, while it advances themselves specially. A broad, human idea will be in the long run of much more advantage to them, even, than a contracted, selfish practice.

Machines are built in one section of the country and sent to another, perhaps at a distance of a hundred or a thousand miles from the place of manufacture. They may be used where the tools and talent necessary for their repair are wanting, or, at least, where only ordinary means and appliances for such a purpose are to be obtained. In such cases the difficulties of repairing a break, or remedying a defect, are greatly increased if the parts have been made to an odd gage. Perhaps a screw is wanting and the thread is fractional; there is no remedy but to send to the manufacturers at an expenditure of time and money, which at times can be ill made.

This difficulty can be partly obviated by sending duplicates of those parts most likely to be lost, broken, or injured; but it does not cover all the exigencies which may arise. If a uniform system of gages for iron work was generally adopted, or agreed upon by the leading concerns of the country, the use of machinery would become more popular, particularly in agricultural sections, and much of the cost of repairs be saved. There can be no adequate reason why such a system should not be adopted. The clannish prejudice that seeks to monopolise all the benefits of one particular method of doing work, which is not the subject of a patent, by refusing to adopt a general design, is too belittling to measurably influence our mechanics in opposing such a movement.

CHILLED SHOT AND THE SHOEBURYNESS EXPERIMENTS.

As the facts come to hand, it is apparent that the success of the shots made by the nine-inch gun at Shoeburyness, on the 20th of September, was due mainly to the character of the projectile, and not to the gun nor the charge of powder. The Palliser shot and shell are made of chilled iron, which has been pretty satisfactorily proved to be superior in penetrating qualities to either wrought iron, ordinary cast iron, or steel. Both steel and chilled shots were used in these experiments, but while the hardened-steel shots failed to penetrate through the target, and either broke in pieces, or were compressed and bulged out of shape, every one of the chilled-iron shots did effective service, never in one instance changing in form.

The target used was about forty feet long by eight feet high, built of a single thickness of rolled wrought iron, eight inches through, bolted by the Palliser screws to a backing of eighteen inches of teak timber and an inner plate of three-quarters of an inch iron. The whole was sustained by heavy timber backs. The face of the target was not in one plane, but half of its length was inclined at an angle of thirty degrees to the other half, the line of fire being the same in both cases; so that a shot against the inclined face would make, with the target, an angle of sixty degrees. The gun was a nine-inch muzzle-loading rifle, with increasing twist of thread, throwing shot of 250 pounds with charges of forty-three pounds of powder. The distance fired was 200 yards.

The steel shot were cylinders having either pointed heads, struck on a circle the diameter of the shot, flat heads, or the Belgian or ogee head. All of them were hardened in prussiate of potash and oil, or water. Some of them were solid, others, shells with the head screwed into the body, or the base secured in the same manner. Out of twenty-four shots twelve were of this character. Not one of them passed through the target, and every one was either broken into fragments or bulged out of shape.

The Palliser chilled shots in every case penetrated the iron plate, and in one instance, on the square face of the target, went entirely through plate, backing, and lining, and lodged in a pile of iron plating, brick, and stone masonry, twelve feet in the rear of the target. In no instance was the form of the shot changed. The Palliser shots and shells have heads formed on a radius of one-and-a-half diameters of the cylindrical portion. Whenever the Palliser shots struck the inclined face of the target they penetrated, while the cast-steel shots sometimes glanced off.

One circumstance in this trial is remarkable. The steel shots were so hot after striking the target that they could not be handled, while the chilled shots were barely warm. This, with the fact of the change of form in the steel projectiles, proves that much of the energy of the shot had been expended in this direction instead of in penetration.

While the velocity of the shots fired in our Fortress Monroe experiments exceeded in no instance 1,155 feet per second, that of those in this Shoeburyness trial ranged from 1,200 to 1,340 per second. At such an initial velocity, with a distance of only 200 yards between the gun and target, it ceases to be very surprising that it was possible to throw shot through such a barrier.

SOUTH AMERICAN BEEF IN ENGLAND.

In No. 14, present volume, we made a notice of several plans proposed in England for bringing the beef of South American cattle into that country in a fresh state. Among them was that of Messrs. McCall & Sloper, which was but the ordinary process of canning, so well known here, except that the meat is in no case partially cooked, and the tins are lined with a veneer of wood, for what purpose we are not informed.

By our recent English exchanges, we find the trial has been made, and has proved eminently satisfactory. On the 27th ult. a public entertainment was given, at the London Tavern, at which the courses were composed of beef from Buenos Ayres, served up in soups, steaks, roasts, boiled, stewed, in pies and puddings, and pronounced by gastronomic critics and regular "diners-out" to be unexceptionable. The chairman of the meeting stated that there were annually exported from that district of South America 2,500,000 hides, the carcasses being left to rot, or used as manure. He said, also, that the meat could be put up, shipped to England, and retailed over the counter, by the pound, at less than five pence—eight cents.

This is a subject as interesting to us as to our English cousins. The high price of beef here, especially in our cities and large towns, is alarming. Steaks from twenty to thirty cents per pound are luxuries not to be indulged in by everybody. Even corned beef retails at twenty cents. We need not go to South America to procure cheap beef, if it can be put up and transported in a fresh state. Texas is, *par excellence*, a cattle-growing country. Immense herds range over its prairies, which never find their way north except on the hoof. Here is an opportunity for some enterprising man, or a company, to benefit the community and make fortunes.

Even if we went to South America, it seems as though a very large margin might be left for profit. The price of beef which is eaten in this country, more than any other meat, fixes the price of other meats, and if this could be furnished at a cost to the consumer of from eight to ten cents per pound, the expenses of living would be very sensibly reduced.

THE SIMPSON PROCESS.

The collodio-chloride, or Simpson process for photographic printing, was published in the SCIENTIFIC AMERICAN about a year ago, and is now extensively employed in this country, especially in the production of "porcelain" photographs. It is the discovery of G. Wharton Simpson, Esq., Editor of the London *Photographic News*, who declined to take patents, but generously donated the improvement to the public service. The Simpson process consists in the addition to the common collodion of a small quantity of nitrate of silver and a chloride, which forms chloride of silver in the collodion, and imparts to it the appearance of milk. This collodio-chloride, on being poured upon paper, glass, or other substance, and dried, forms a highly sensitive and polished surface, upon which prints of great beauty may be produced, by means of a negative, in the usual manner. Applied upon what is termed "porcelain glass," the process is capable of remarkable artistic effects.

We believe that our countrymen enjoy the reputation of producing the best results in the line of porcelain pictures, and probably no one has succeeded in carrying the art to higher perfection than Mr. J. M. Herron, whose studio, corner of Fifteenth street and Sixth avenue, New York, we lately visited. It is a model establishment throughout. His porcelain specimens are among the finest that we have seen. As an operator he seems to possess the real artist feeling, and while preserving the best natural expression of the subject, produces a portrait of exceeding brilliancy, softness, and delicacy—the hard lines, wrinkles, furrows, freckles, etc., being reduced or omitted. Ordinary people are thus made to yield charming pictures, and natural beauty is exquisitely rendered. Lovers of the art will be gratified by an examination of Mr. Herron's specimens.

Porcelain pictures have the quality of exhibiting the subject both by reflected and transmitted light. Each method of viewing gives a different effect, as

that such prints are, in a certain sense, double pictures.

The porcelain glass used in photography is, we believe, composed of ordinary window glass rendered opaque and milk-white by the mixture with the molten metal of oxide of tin and arsenic. We do not know the exact formula, and we wish that some of our readers would send it to us for publication.

ISSUED FROM THE U. S. PATENT OFFICE

FOR THE WEEK ENDING OCT. 16, 1866.

Reported Officially for the Scientific American.

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of models required, and much other information useful to inventors, may be had gratis by addressing MUNN & Co., Publishers of the SCIENTIFIC AMERICAN, New York.

58,749.—TANK FOR CONTAINING AND TRANSPORTING PETROLEUM.—W. C. Allison, Philadelphia, Pa.

First, I claim a vat or reservoir, having an outer casing of wood and a thin petroleum-proof lining of metal, so suspended within the casing and detached from the sides and bottom of the same that it can readily, and without danger of rupture, yield and accommodate itself to any twisting or other distortion of the vessel, as set forth.

Second, The combination, as described, of a tank or reservoir, consisting of an outer casing of wood and a petroleum-proof lining with the frame of a car.

Third, The air space between the tank and sides and roof of the car, for the purpose described.

Fourth, The perforated pipes, M', or their equivalents, forming a communication between the interior of the tank and the ventilated space, N', beneath the roof.

Fifth, Causing the mixed air and gas to pass through the perforations of the ventilator, V, before it reaches the external air, for the purpose described.

Sixth, The roof, G, of the tank, with its transverse beams, q, both being covered with a petroleum-proof lining, substantially as described, and the transverse beams serving to prevent undue agitation of the contents of the tank, as set forth.

58,747.—MACHINE FOR PEELING WILLOW.—George S. Anderson, Jeffersonville, Ind.

I claim the wheel, E, rollers, H, brakes, S and V, when constructed, combined and arranged to operate together, substantially in the manner and for the purpose specified.

58,748.—GEOGRAPHICAL MAP.—E. A. and A. C. Apgar, Philadelphia, Pa.

First, We claim the use for map drawing of such geometrical figures as are constructed by taking in each case some one line as a measuring unit, by means of which the lengths of other lines about the figure are determined.

Second, We claim the trisecting and bisecting of certain lines about our geometrical figures for the purpose of determining the positions of certain prominent points along the coast lines of the continents.

Third, We claim, as original with us, and desire to secure by letters patent, that symbolic language for maps in which dots and lines, arranged substantially as described, are used to represent certain numbers, whether of population of cities, or the height of isolated hills, mountain peaks, or plateaus, in feet or miles, or other units of measurement.

58,749.—SCREEN FOR GAS PURIFIER.—T. G. Arnold, New York City.

I claim the new manufacture of galvanized metal gas sieves, in contradistinction to ungalvanized iron gas sieves, for the purposes hereinbefore set forth.

58,750.—EGG BEATER.—Varnum G. Arnold, Providence, R. I.

I claim the combination of the cylindrical can, provided with a funnel-shaped mouth and a broad base with a series of cutters spirally arranged and fixed to the inside of the can, or to a rim fitting inside the can.

58,751.—CARPET STRETCHER AND TACK HOLDER.—Frederick Ashley, New York City.

I claim the device, for the purpose specified, consisting of the toothed bar, B, and the spring arm, F, with its notched end, G, bearing against the inner side of the notched jaw, H, of the bar, B, and operating in the manner and for the purpose described.

58,752.—MACHINE FOR PLANTING COTTON SEED.—Nathan E. Badgley, New York City.

First, I claim the construction of the base, V, and its connection with the handles.

Second, The manner of constructing the draft piece, D, with its fastenings.

Third, The construction of the hopper with its several hoops and its attachment to the cross piece, T, as herein described.

Fourth, The attachment of the cover, M, to the base and the rod, B, with its coiled spring, N.

Fifth, I also claim the combination of the several parts as herein described and substantially set forth.

58,753.—WASHING MACHINE.—Alexander Badlam, Sr., San Francisco, Cal.

I claim the combination and arrangement of the water box with curved slats, s, metal dogs, E E (serving as weights), handle, E', and dash boards, c c, the whole being constructed and arranged for joint operation, substantially as described.

58,754.—BARREL MACHINERY.—Horace Baker, Cortland, N. Y.

First, I claim the annular wheel, O, and knives, O', in combination with the swinging frame, P, when respectively constructed and arranged for use, substantially as set forth.

Second, The combination and arrangement of the annular guide, F, and pulley, G, for suspending and revolving the barrel of a churn, with the guide bar, H, carrying the plane, I, and operated by an automatic feed, substantially as set forth.

58,755.—USE OF HYDRO-CARBON LIQUIDS FOR TRANSMITTING HEAT.—William C. Baker, New York City.

I claim the employment of hydro-carbon liquids to circulate in heating surfaces, as and for the purposes set forth.

58,756.—WASHING MACHINE.—Hiram Barker, Aurora, Ind.

I claim the construction of the watering tub, A, the movable rack, D, with its pins, the flange, E, and ribs, F, all the whole being arranged and operating in the manner herein set forth.

58,757.—GLOBE.—Elias Bascom, New York City.

I claim the construction of a transparent or opaque globe, with adjustable wires and end plates, in combination with an illuminated axis, as herein described and for the purposes set forth.

58,758.—WOOD-TURNING LATHE.—August Basse, Quincy, Ill.

I claim the arrangement of the carriage end, J2, stand, J3, and stand, K, for the purpose of supporting the cutter shaft, K', and permit it to be set and fastened at such a position or angle as may be desired, when constructed and operating substantially as described.

58,759.—WHIFFLETREE.—Alonzo Bell, Washington, D. C.

I claim, as the distinctive feature of this improvement, the application of a combination swingletree and clevis to the center of double whiffletrees whereby a direct and equalized strain is brought to bear on the center of the carriage, so that by the application or combination of movement the traces shall have free play, and equal and steady draft imparted to the centre of the carriage, and the present continual leverage of one horse against the other obviated.

58,760.—HOOP LOCK.—G. N. Beard, St. Louis, Mo.

I claim a hoop lock formed with a rectangular slot, a1, connecting with and forming a part of curved slots, a2 and a3, substantially in the manner and for the purpose herein set forth.

58,761.—CREASING OR ORNAMENTING LEATHER.—James M. Bent, Wayland, Mass.

I claim the revolving creaser, I, in combination with the self adjusting pressure roll, K, operating substantially as described for the purpose set forth.

I also claim, in combination with the above, the lever, Q, or its equivalent, substantially as and for the purpose described.

I also claim the gage, l, in combination with the creaser, I, and pressure roll, K, substantially as set forth.

58,762.—PUNCHING LEATHER.—James M. Bent, Wayland, Mass.

I claim the revolving punch, I, with its die, E, substantially as and for the purpose set forth.

I also claim, in combination with the above, the pin, g, for clearing the punch, I, substantially as described.

I also claim the spring, 6, or its equivalent, for the purpose of causing the die, E, to adapt itself to leather of varying thickness, substantially as set forth.

58,763.—SOUND BOARD FOR PIANOS.—Jacob Benz, Philadelphia, Pa.

I claim the construction and combination of two different sound boards with transverse-running wood fibers, and provided with supporting ribs and air passages, substantially and for the purpose as described and set forth.

58,764.—GAS BURNER.—Hermann Berg and Andrew Blessing, Springfield, Mass.

We claim, as a new article of manufacture, the Argand burner, constructed in the manner herein set forth.

58,765.—FRICTION CLUTCH PULLEY.—George W. Bishop, Stamford, Conn.

I claim the arm, C, and dog, D, pivoted thereto parallel with the pulley, A, operating in combination with the sliding sleeve, E, substantially as described and for the purpose specified.

58,766.—PISTON PACKING.—James Broughton, Lambertville, N. J.

First, I claim the arrangement of the body, A, hub, B, division plate, D, follower, E, rings, b b', grooved T-shaped keys, c, springs, f, in the recesses, g, combined and operating in the manner and for the purpose herein specified.

Second, The grooves, a, in the keys, c, which close the joints of the packing rings, for the purpose set forth.

58,767.—LUBRICATOR FOR STEAM ENGINE.—John Broughton, New York City.

I claim the combination and arrangement of the reservoir, O, and valve seat, E, having vertical openings, p p, and made to screw into the shank, B, with the nipple, F, tubular cap, G, and air chamber, k, the whole being constructed and operated substantially in the manner and for the purpose set forth.

58,768.—GRINDSTONE-JOURNAL BOX.—Thomas W. Brown, New York City.

I claim the improved grindstone-journal box as made with the wheel-journal caps, c c c c, arranged and combined with the wheel cover, C, so as to extend over and about the wheel journals, substantially as and for the purpose specified.

I also claim the arrangement and application of the duplex spring catch, E, with the projections, d d, from the cover, c, and with the sides of the box, A, as specified.

58,769.—METHOD OF SINKING AND TUBING WELLS.—John H. Bruin, Elmira, N. Y.

I claim a tube and boring bit for sinking and tubing wells, consisting of a tube, A, and internal perforated tube, B, to the base of which is attached a spiral bit, C, and having a socket in the bottom of the tube, B, for receiving the point of the rod, D, said several parts being respectively constructed and combined for use, substantially as set forth.

58,770.—EGG BEATER.—Charles H. Butterfield, Sturbridge, Mass.

I claim, as an improved manufacture, the glass egg beater jar as made, with the contraction as arranged at or near its middle, the same being as and for the purpose or objects as hereinbefore set forth.

I also claim an egg beater as composed of the case contracted at its middle, as represented, and a liquid rotator arranged within the contraction and connected to the stopple of the case, by means substantially as set forth.

58,771.—CAR-SEAT INDICATOR.—Francis H. Carney, Boston, Mass.

I claim the car-seat indicator, constructed substantially in manner and for the purposes hereinbefore described.

58,772.—COFFEE MILL.—Nathan Chapman, Hopedale, Mass.

First, I claim locking or fastening the top of the mill case together, by making the bottom of the hopper to surround the top of the case, when constructed and operating substantially as described.

Second, I claim making the bottom of the hopper eccentric, or the top of the case eccentric, or both, for the purpose of adjusting the top of the case to make the mill grind fine or coarse, substantially as described.

58,773.—SULKY PLOW AND HARROW.—James E. Chesebro, Buffalo, N. Y.

First, I claim the combination and attachment of a plow to a sulky in such manner that the plow beam shall pass under the axle of the sulky and project forward, and the plow handles project in rear of the axle and in convenient grasp of the plowman as he sits upon his seat, substantially as set forth and described.

Second, The combination of the guide stirrup, B, with the slide, G, for the purpose of forming a connection of the forward end of the plow beam with the sulky, substantially as set forth.

Third, Connecting the rear end of the plow to a brace or foot board, D, projected from and in rear of the axle, for the purpose and substantially as described.

Fourth, The driver's seat, A4, and foot board, D, projected and supported in rear of the axle, for the purpose and substantially as set forth.

Fifth, The combination of a harrow, M, with the sulky, for the purpose and substantially as described.

58,774.—GLOBE VALVE.—William Chesley, Cincinnati, Ohio.

I claim the construction and arrangement of the box, d, cap, b, and ring, a, with reference to the valve stem, c, for the purpose and as herein set forth.

58,775.—GOVERNOR VALVE FOR STEAM ENGINES.—William Churchill, St. Louis, Mo.

I claim, First, The arrangement of the throttle and governor valves, in the manner substantially as set forth.

Second, The combination of the nut, G, stem, F, and spring, H, whereby to secure the seated and regulation of the governor in accordance with the demands of power and speed.

58,776.—SETTING FENCE POSTS.—Henry W. Clarke, Newport, R. I.

I claim the arrangement and application of the hollow frustum, B, its cement or head, D, and the mass of gravel, E, or its equivalent, with a post, A, the whole being substantially as and for the purpose set forth.

58,777.—MILL FOR CRUSHING QUARTZ.—Cummings P. Colby, Lancha Plana, Cal.

I claim the combination of the eccentrics, B', with collars and spindles and springs, s, arranged to operate the stampers, substantially as described.

58,778.—STRAW CUTTER.—Robert Conarroe, Camden, Ohio.

I claim, First, The combination of the eccentric, e, pin, d, and roller, d'.

Second, The combination of the grooved eccentric cams, F, on the shaft, G, with the guides and frame C D, and knife, E, of a straw cutter, substantially in the manner and for the purpose set forth.

58,779.—WOOL PRESS.—Solon Cooley, Oakwood, Mich.

I claim the arrangement of the bottom board, A, the sides, B B, and ends, C C', as constructed with the follower, H, spring arms, G G, rack bars, F, and hooks, I I, substantially as and for the purpose herein specified.

58,780.—SHAFT FOR RUBBER ROLLERS FOR WRINGING AND WASHING MACHINES.—John Cram, Chicago, Ill.

I claim constructing a shaft, A, with a series of recesses and corresponding pins or projections arranged and operating substantially in the manner and for the purposes herein specified and described.

58,781.—LADDER.—Charles Croley, Dayton, Ohio.

First, I claim the sliding pieces, h h, connected to the ladder, A and B, substantially as and for the purposes specified.

Second, The combination of the projections, g g, the hooks, I I, and step, S, substantially as and for the purpose described.

Third, The base pieces, C, the braces, D, and jointed bar, E, when constructed and arranged with reference to the ladder, B, in the manner substantially as described and for the purpose specified.

58,782.—HEATING STOVE.—E. N. Cummings, Colebrook, N. H. Antedated Oct. 4, 1866.

I claim a stove for heating purposes made substantially as above described, its upper and lower parts, A E, being connected by serpentine flues whose openings in the upper part, E, are controlled by two independent dampers, substantially as shown.

58,783.—PROJECTILES FOR ORDNANCE.—J. M. Currie, Washington, Iowa.

I claim the projectile, A, with the conical point and tapering rear, having the packing ring, B, applied as shown and described.

58,784.—DEVICE FOR HANGING WALL PAPER.—James Warren Davis, Washington, D. C.

I claim the roller, D, having a yielding surface, the clamping bar, E, the frame, A B C, the pivoted arms, F, the bell crank, G, and the spring rods, J M, the whole arranged and operated substantially in the manner and for the purpose herein described and represented.

58,785.—MACHINE FOR HARVESTING, HUSKING AND SHELLING CORN.—D. A. Dickenson, Baltimore, Md.

First, I claim a machine for cutting the stalks from the hill or row, separating the stalk from the ears, husking the ear and shelling it, when the different pieces or parts thereof are constructed, arranged, and operated substantially as herein recited.

Second, I claim combining with cutting and husking or shelling machines the arrangement of the means or parts constituting the apparatus for cutting the stalk from the hill or rows, when constructed and operated substantially as set forth.

58,786.—CAR WHEEL.—Wallace Dickinson, Brooklyn, N. Y.

I claim the elongated hub, H, having flanges, s s', provided with a bush, d, having cavity, c, and openings, m m n, and washer, W, all constructed and arranged substantially as described and for the purpose set forth and shown in the accompanying drawings.

58,787.—SKID FOR SUPPORTING BARRELS.—W. W. Doane and W. P. Burr, Brewer, Me.

We claim the improved hogshead supporter, or combination and arrangement of rollers and skids, made and applied substantially as specified.

58,788.—GANG AND SUB-SOIL PLOW.—R. L. Dodge and E. M. Walker, Gallatin, Mo.

First, We claim the construction and arrangement of the pole, H, in connection with the standard, I, and axle, B, so that it may be elevated and lowered, substantially as described.

Second, We claim the pole, H, when hinged to the cross-bar of the frame so as to form a lever to raise the plows, in combination with the plow beams, E E, and plows, C C', when constructed for the purposes and substantially as described.

58,789.—COMPOSITION FOR WALKS, PAVEMENTS, ETC.—W. C. Dodge, Washington, D. C.

I claim the composition and process herein described when applied as and for the purposes set forth.

58,790.—MAGAZINE FIRE-ARM.—Wm. C. Dodge, Washington, D. C.

First, I claim the sliding tube, B, with the spring, g, attached and sliding in the groove, h, in combination with the barrel, A, and breech frame, C, when said parts are arranged to operate as and for the purposes herein set forth.

Second, in combination with the sliding tube, B, I claim the spring catch, c, located inside of the breech frame, C, and arranged to be operated from the outside, as shown and described.

Third, I claim forming the chamber for the reception of the cartridges at the rear end of the tube, B, by means of the pieces, m, or their equivalents, substantially as described.

58,791.—STEERING APPARATUS.—F. P. Duprazy, S. M. Dumont, and John Dickason, Veray, Ind.

First, We claim the intermediate sleeve or double spiral and drum, D E, constructed substantially as set forth for the purpose specified.

Second, We claim the arrangement of the wheel, A, drum, B, rope or chain, C, drums, E E', pulleys, D D' F, and tiller, G, forming a progressive-power steering apparatus, as described.

58,792.—HAT BOX AND VALISE.—Zoheth S. Durfee, Philadelphia, Pa.

I claim combining a hat box with a modification of the common traveling bag or valise, substantially as and in the manner described and shown in the accompanying drawings.

58,793.—WATER COOLER.—John Eckert, Madison, Ind.

I claim the sheet-metal chamber, A, cast bottom, B b, and thimble, C c, the whole being combined and adapted to operate as set forth.

58,194.—INSTRUMENT FOR TRANSPLANTING PLANTS.—W. C. S. Ellerbe, Camden, S. C.

I claim an improved plant transplanter formed of a cup, A, handle, C, and of a pusher, D, and rod, G, constructed and com-

bined with each other, substantially as herein described and for the purposes set forth.

58,795.—Animal Trap.—Saml. F. Estell, Richmond, Ind.

I claim a rat trap in which the self-setting devices as set forth and described and placed in an apartment of said trap immediately above and separate from the body of the trap, substantially as and for the purposes herein mentioned.

58,796.—Valve for Steam Engine.—Richard P. Estep, Cincinnati, Ohio.

I claim the balanced yielding and adjustable three-winged valves, K L (one or both), arranged and operating in the manner substantially as described.

58,797.—Wagon Brake.—H. C. Fairchild, Brooklyn, Pa.

I claim as an improved wagon brake formed by combining the spring catch, F, slide, C, straps, G T and H, lever, I, hinged brake bars, B, rests, K, and stops, L, with each other and with the wagon body, A, the parts being constructed and arranged substantially as herein described and for the purpose set forth.

58,798.—Corn and Cane Planter.—James M. Fate, Boonsboro, Iowa.

First, I claim attaching the seed-dropping device to a frame or beam, F, in combination with a transporting frame, substantially as described.

Second, I claim the vertically-swinging beam, F, in combination with a lever, G, and a treadle, H, substantially as described.

Third, I claim the combination of the lever, K, with a suspended beam or frame, F, substantially as described.

Fourth, I claim pivoting the forward end of the drag bar, F', of the beam, F, to the draft pole, C, substantially as described.

Fifth, I claim suspending the beam, F, or its equivalent, from the main frame centrally, substantially as described.

58,799.—Device for Opening Furnace Doors.—Henry Fessler and Henry Maxell, Canton, Ohio.

First, We claim the door, F, pin, a, bar, E, and shaft, C, arranged and used substantially as and for the purpose herein specified.

Second, We claim the arrangement with the shaft, C, of the connecting link, c, lever, G, foot piece, I, and spring, J, substantially in the manner and for the purpose set forth.

58,800.—Priming Cartridges.—George A. Fitch, Kalamazoo, Mich.

First, I claim igniting the cartridge at the front by means of the stem, s, in combination with the accelerating charge, as shown in Fig. 1, and as herein described.

Second, I claim igniting the charge at both front and rear as shown in Fig. 2, and as herein set forth.

Third, I claim providing a cartridge with the stems, s and s', when arranged to act in combination, as shown in Figs. 3 and 4, for the purpose of igniting the charge at the center, substantially as set forth.

58,801.—Pump.—A. F. Fletcher, Athol, Mass.

First, I claim the combination of the loose collar, C, with the pump barrel, A, and both with the posts, E, and all with the bottom plate, F, constructed and operating substantially as described and for the purposes specified.

Second, I claim the combination of the double rod, M M, when the parts are connected together by the staple, S, and with the pump box, Q, and with the pump handle, P, constructed and operating substantially as described.

Third, I claim the guides, H, for the valve applied to the lower plate of the valve box, substantially as described.

58,802.—Steam Generator.—M. Foreman, Philadelphia, Pa.

First, I claim the tubular bolts, C, combined with and adapted to the system of spheres, A, substantially as and for the purpose herein set forth.

Second, I claim the manner described of arranging bolts in respect to the spheres so as to prevent the staking of the same.

58,803.—Oil-well Drill.—Charles Forster, Pittsburgh, Pa.

I claim, First, The combination in a drilling tool of curved cutters, d, having slots, e, and oblique edges, f, substantially in the manner and for the purposes above set forth.

Second, The combination in a drilling tool of the head, a, the springs, s, the plunger, b', the ratchet, r, the pawls, p, for the purpose of producing a rotary motion and communicating the same to the cutters, d, and barrel, a, the whole being constructed and arranged substantially as and for the purposes above described.

Third, The combination in a drilling tool of the abutment, f, screw box, m, screw, o, and adjustable jam nut, o', used and operated substantially as and for the purposes above set forth.

Fourth, The use of the ring or collar, c', in combination with the shaft, b, of a drilling tool furnished with expanding cutters, as a gage to indicate the degree of spread of the cutters within the chamber of a well.

58,804.—Hay Raker and Loader.—J. W. Foust, Evansburgh, Pa.

I claim the arrangement of the clutches, H, with the wheels, D D, and shaft, G, of the reel or drum, K, in conjunction with the levers, M, attached to the lever, N, and all arranged to operate in the manner substantially as and for the purpose set forth.

58,805.—Cultivator.—John Fridy, West Donegal Trop, Pa.

I claim the construction of my adjusting bar, D, 8x4 in its center to the central beam, 2, and provided with a series of holes, G, for the hook bolts, E, supporting and embracing the side beams, 1 and 3, in combination with the pivots, A, when supported between the plates, P and p, in the manner and for the purpose shown and described.

58,806.—Shaking Table.—William B. Frue, Houghton, Mich.

I claim, First, The undulating top, G, forming a series of concave troughs, substantially as and for the purpose described.

Second, The agitators, h, and discharge openings, i, in the several troughs of the top, G, substantially as and for the purposes set forth.

Third, The crank shafts, B and F, and links, a c, in combination with the table, G, constructed and operating substantially as and for the purpose described.

58,807.—Boiler for Gas Heater.—Charles Geisse, Taycheedah, Wis.

I claim the combination of the heaters, A B, arranged and operating in relation to each other and to the vessel or vessels containing the fluid or other matter to be heated and to any known appliance for the combustion of oil, coal oil, or other inflammable fluid, gas, or vapor, substantially upon the principle and in the manner hereinbefore set forth.

58,808.—Steam Trap.—James E. Gillespie, Boston, Mass.

I claim a steam trap constructed and applied substantially as herein set forth.

58,809.—Mode of Sinking Well Tube.—John Gillmore, Jr., and Aaron Wicks Gillmore, Utica, Penn.

We claim the drill, B, with the flanges, 4 5 6 7, in combination with the collar, E, and the tube, D D, when the same are constructed as described in the aforesaid combination, for the purposes set forth.

58,810.—Device for Lowering a Boat.—Henry Goulding, Dedham, Mass.

I claim the device for the purpose specified, consisting of the stud, b, lever, d, chain, c, chain, g, and pivoted lever, h, arranged and operating as described.

58,811.—Radiating Stove and Drum.—George D. Greenleaf, Depauville, N. Y.

I claim the pipe, C, leading from the stove, A, and the drum, B, placed on the stove, and inclosing pipe, C, in combination with the partition plates, D D, and dampers, F E, all arranged substantially as and for the purposes specified.

I further claim the partition plates, E E', in the pipe, F, forming the draft passages, F E, and arranged with the dampers, I I', as shown, in combination with the drum, B, and the parts contained therein, as specified, and all arranged to operate in the manner substantially as and for the purpose set forth.

58,812.—Machine for Making Paper Collars.—Joseph W. Griswold and John Sigwalt, Jr., Chicago, Ill.

We claim, First, The combination, in one machine, of the adjustable stitching plate, M, punches, or their equivalents, a, and adjustable end clips, l n, arranged and operating substantially as and for the purposes specified.

Second, In combination with the above, we claim the employment of the longitudinal shears, T U, arranged as cp resting as and for the purpose set forth.

Third, We claim constructing the stitching plate, M, in three parts, one, M', removable, and one or more adjustable, substantially as herein specified, and for the purposes set forth.

Fourth, We claim the combination of the adjustable stitching plate, bevelled punches a and end clips, arranged and operating as and for the purposes specified.

Fifth, We claim the arrangement of the adjustable width gages, S S, with the shears, T U, as and for the purposes set forth.

Sixth, We claim, in combination with the adjustable stitching plate, punches, and end clips, the employment of the adjustable feeding guide, R, as and for the purposes described.

Seventh, We claim providing the bed plate, B, with the longitudinal opening, V, arranged as and for the purposes specified and shown.

58,813.—Distilling Apparatus.—C. H. Hall and John Ellis, New York City.

We claim, First, The arrangement of two or more retorts, A B, through which the liquid to be distilled passes in a thin stratum, substantially as and for the purpose described.

Second, The flues, C E, in combination with the retorts, A B, and fireplace, D, constructed and operating substantially as and for the purpose set forth.

Third, The pipes, G G', leading from the retorts, A B, to one and the same condensing chamber, H, substantially as and for the purpose described.

Fourth, The inclined condensing chamber, H', in combination with the inclined condensing chamber, H, and retorts, A B, constructed and operating substantially as and for the purpose set forth.

Fifth, The residuum tank, I, with pipes, W u s, in combination with one or more retorts, constructed and operating substantially as and for the purpose described.

Sixth, Passing the vapors through a closed vessel containing a pipe or pipes, through which cold water passes, said vessel being provided with one or more discharge pipes to draw out the condensed liquid of any desired gravity, substantially as set forth.

58,814.—Garden Cultivator.—Joel A. Hall, Columbus, Ohio.

First, I claim the cross handles or levers, E, attached to the side pieces, D D, in combination with the hoes, K K, axle, B, and wheels, A A, substantially as described.

Second, I claim the plate, F, in combination with axle, B, for the purposes and substantially as described.

58,815.—Boat for Traveling on Ice.—John R. Halsey, Newark, N. J.

First, I claim the arrangement of the geared wheels, c and d, for giving motion from the crank shaft to the main shaft, in combination with the lifting lever, e, or its equivalence, for adjusting the position of the main shaft and its driving wheels, the whole operating substantially as and for the purposes set forth.

Second, The application and use of the guard springs, s, in front of the runners, substantially as and for the purposes set forth.

Third, Connecting the movable or swinging sleds and the stern rudder with the steering mechanism, substantially in the manner described, so that the said sleds and stern rudder may be simultaneously actuated by such mechanism, as and for the purposes herein shown and set forth.

Fourth, The application and use, in combination with a rudder, hinged as described, of a spring to act upon such rudder, and keep the same in contact with the ice, for the purposes set forth.

Fifth, A steam ice boat, its several parts constructed, arranged, and operating substantially as and for the purposes set forth.

58,816.—Car Truck.—R. Jones Happersett, Coatesville, Pa.

I claim the inner pedestal, D, attached to the bottom of the truck, and provided with a recess, partially inclosing the upper portion of the hub, on the inside of the wheel, so as to form a socket therefor, in case of the breaking of the axle.

58,817.—Mop Head.—Freeman M. Hardison and John A. Hooper, South Berwick, Me.

We claim the combination of the movable wire frame, C, with the sliding ring, D, and grooved handle, A, when constructed and operating as and for the purpose specified.

58,818.—Railroad Switch.—Andrew Hartman, Canton, Ohio.

First, I claim the turning lever, J, when used with the bar, D, rails, C C, and a catch under said rails, as and for the purpose specified.

Second, The spring, G, when used with the rails, C C, the lever, J, and catch under the rails, C, as and for the purpose herein specified.

Third, The arrangement of the levers, H and I, the rails, C C, and bar, D, with the turning bar, J, spring, G, and lever, E, for operating the switch automatically, as well as by hand, substantially as specified.

58,819.—Combined Cultivator and Ditcher.—Nathan Hawkes, Appleton, Me.

I claim all the various parts, constructions, combinations, and arrangements hereinbefore described, for planting, hoeing, digging, and ditching, except so far as the mold boards, A, the beam, B, and the handles, C C, fig. 1, are like those of the common double-mold-board plow.

58,820.—Instrument for Removing Wire from Bottles.—J. S. Hazard, Newport, R. I.

I claim the implement herein described, the same consisting of the fork-shaped bar, E, and hook lever, G, when combined together, substantially in the manner and for the purpose described.

58,821.—Cask and Barrel.—Michael Hickey, Boston Mass.

I claim rabbeting out the edges of the staves, and heading and filling the rabbets with a spline or strip (glued, cemented, or otherwise), covering the joints between the staves or pieces of heading; and in combination with the splines, I claim the pins, glued, cemented, or otherwise, as aids in fastening the splines.

I also claim the pins, between the staves, in the chimes of the cask, glued, cemented, or otherwise.

I claim cutting the rabbets under, and making the splines or strips dovetailing, substantially as described.

58,822.—Lamp Stove for Dentists.—S. P. Hildreth, Mount Vernon, Ohio.

I claim the jackets, F, in combination with the body, B, of the stove having collars, D, and pipe, G, substantially as described, for the purpose specified.

58,823.—Apparatus for Making Vinegar.—Arnold Hoeppner, St. Louis, Mo.

First, I claim the combination of a series of shallow vessels in which, by surface oxygenation, the acidification of the wash is effected.

Second, The combination of the vessels, A1 A2 A3, etc., their overflow openings, c4, arranged at diagonally opposite ends, substantially as set forth.

Third, The separation of each vessel, A1 A2 A3, etc., into compartments, C C1 C2, etc., the same connecting by apertures, d, substantially as set forth.

Fourth, The combination of the vessels, A1 A2 A3, etc., with shutters, I, as and for the purpose set forth.

58,824.—Manufacture of Sugar from Corn.—Adolf H. Hirst, New York City.

I claim, First, The application of diluted acid at an elevated temperature in the process of making starch from maize, and other cereals, for the purpose of making syrup and sugar therefrom, substantially in the manner set forth and specified in the first manipulation.

Second, Treating saccharine liquid with alkalies and charcoal coke or bone black combined, substantially as and for the purpose set forth.

Third, The within described process of manufacturing syrup and sugar from corn, or other grain, consisting of three subsequent manipulations, substantially such as set forth.

58,825.—Dust Pan.—Amelia B. Hoffman, Roxbury, Mass.

I claim the combination of the box, B, the lid, A, the inclined edge or apron, B, and the handle, D, all as and for the purpose described.

58,826.—Animal Trap.—John W. Hollingsworth, Seymour, Ind.

I claim an improved animal trap, formed by the combination of the rocking lid, C, the stationary cap, B, the lifting gate, L, the treadle, K, cam wheel, J, spring, I, cranks, G and H, and connecting rod, F, with each other, and with the box, A, substantially as herein described and for the purposes set forth.

58,827.—Method of Hanging Doors.—George W. Holly, Low Moor, Iowa.

I claim the arms, f f', and rods, s, arranged and operating relatively with the bars, C F, and door, A, substantially as described, for the purpose specified.

58,828.—Attaching Handle to Saw.—N. Homes, Leonn, N. Y.

I claim the saw handle, B, constructed and arranged, substantially as described and for the purpose set forth.

58,829.—Sponge Cup.—Eli H. Howard and Alfred J. Manchester, Providence, R. I.

We claim a sponge dish, constructed substantially as herein described.

58,830.—Braiding Machine.—Leverus Hull, Charlestown, Mass.

I claim my improved compound braiding machine, constructed in manner and so as to operate as described, viz: as composed of the carriers, A B C D E, and their gears, the race circles, I K L M N, the spring cams, I K, and the recessed and cammed plates, H H, the whole being arranged as set forth.

58,831.—Carpet Stretcher.—Henry Hungerford, New York City.

I claim the arrangement of the legs, D and E, in combination with the pieces, A and B, combined and operating substantially as and for the purposes set forth.

Second, The construction of the pressure foot, C, substantially as described, so that the same can be reversed in position and adapted to take hold of or set upon carpets or cloths of different kinds, as and for the purposes set forth.

Third, A carpet stretcher, constructed and operating substantially as and for the purposes set forth.

58,832.—Horse Rake.—Charles S. Huntington, Black River, N. Y.

First, I claim, as a carriage or riding attachment for receiving rakes, the detachable carriage herein described, the same being composed of—1. The wheel and the axle upon which they revolve. 2. The reacher or draft bars by which the carriage is drawn. 3. The platform bars arranged so as to maintain a horizontal position during the rising and falling of the reaches and rake frame.

Second, I claim attaching the reaches and the platform bars of a rake carriage, as described, to the frame of a revolving rake, by hinge and link connections, or the equivalents thereof, in such manner that while the rake frame is free to vibrate, and the rake head to revolve, the platform bars shall maintain their level during such vibration and revolution, substantially as described.

Third, In combination with the thills and side bars, E, of the rake frame, I claim the cross bar, H, constructed as herein described for holding the rake and frame from the ground.

58,833.—Fishing Rods.—Russel N. Lenox, New York City.

I claim the application to the metallic guides and tip of fishing rods an enamel, or covering of glass, porcelain, or any similar vitreous substance, to protect the line from friction and wear, substantially as described.

58,834.—Ditching Machine.—Goodman Jensen, Brooklyn, N. Y. Antedated Oct. 6, 1866.

First, I claim the rotary conoid excavator, formed with the series of scraping blades, l l, and with the flange, 2, at its largest end, against which the soil is scraped, in combination with a stationary trunk, t, and scrapers to convey the soil from the conoid excavator, and deliver the same, in the manner set forth.

Second, I claim the arrangement of the gearing and pulleys for actuating the scrapers and rotary excavator, combined with said rotary excavator, substantially as specified.

Third, In combination with the rotary excavator and transverse conveyors, I claim the stern wheel or propeller, and the bow or rear wheel, the parts being fitted substantially as and for the purposes specified.

58,835.—Hearse.—Melvin Jincks and F. Altmayer, Dansville, N. Y.

We claim the combination of roller, F, the bar, H, board, S, ear, B, and the rails, c, the whole constructed and operating in the manner and for the purpose herein specified.

58,836.—Mode of Producing Variegated Thread.—Robert Kershaw, Philadelphia, Pa.

I claim producing a variegated thread, by imparting to a central thread, or to a guide which conveys a tapping thread to the central thread, such a varying, irregular, intermittent or reversing traversing motion as will cause the tapping thread to be wound on the central thread in different quantities at different points.

58,837.—Stopwater for Oil-well Tubing.—Henry Kewley, Madison, Ohio.

First, I claim the spring, H, the cone, E, and the tube, F, and the flange, G, in combination with the washers, I and J, in the manner and for the purpose set forth.

Second, The dogs, K K, the springs, M M, in combination with the sleeve, F, in the manner set forth.

Third, The sleeve, F, the rods, E, and the washers I and J, in combination with the tube, A, for the purpose and in the manner substantially described.

58,838.—Adjustable Measure.—Kenry Krust, St. Louis, Mo.

I claim the combination of the movable and adjustable receiving cylinder, C, and hollow measuring, piston, A.

58,839.—Apparatus for Separating Metal from Ores.—Stephen R. Kroun, New York City.

First, I claim in combination with the intermittent blowing means and with two or more passages for the escape of the pulverized materials, the employment of one or more gates, G, so arranged as to act on the material to retard the upper strata without retarding the lower strata as it passes down the inclines, substantially in the manner and for the purpose herein set forth.

Second, I claim in connection with the above, the perforated beds, E and E2, arranged at different levels, as herein specified, so that the material shall be separated or partially separated into distinct layers on the upper bed, and be accumulated in thicker strata and separated and led away in independent currents by the gate or gates on the lower bed, as herein set forth.

58,840.—Paint.—Thomas C. Lamb, Chicago, Ill.

I claim the application of the textile fabrics or woven cloth dyed with any dyeing stuffs not fixed, to the purposes of painting the human face.

58,841.—Hay Rake.—Ralph G. Lamson, Brownsville, Vt.

I claim the notches, straps, J, in combination with the spring lever, K, operating with the pins, L, in the rake head, A, constructed and arranged in the manner and for the purpose herein specified.

58,842.—Means for Raising Sunken Vessels.—G. W. Lane and I. N. Bolles, Baltimore, Md.

We claim the combination of the spars, B, chains, A a, and pontoons or casks, C, with the tubes and cocks, all operating substantially as and for the purpose specified.

58,843.—Water Meter and Motor.—Alfred B. Lawther and George F. Letz, Chicago, Ill.

We claim three or more cylinders radiating from a central chamber inclosing pistons connected with a central crank secured to a rotary valve of its equivalent, operating to regulate the flow of water to and from said cylinders, substantially in the manner and for the purpose herein set forth.

We also claim three or more single acting pistons when so combined with a central crank as to operate a rotary valve, and thus regulate and control a flow of water under pressure against said pistons, substantially in the manner and for the purposes herein set forth.

58,844.—Cotton-bale Tie.—Z. W. Lee, Blakely, Ga.

I claim the metallic band, B, having the bend, b, at one end, and the loop, b', at the other end, and applied substantially in the manner and for the purpose described.

58,845.—Stop Cock.—B. E. Lehman, Bethlehem, Pa.

First, I claim the plug made open at its lower end, with a transverse water passage, as and for the purpose set forth.

Second, I claim the stuffing box, D, in combination with the case, A, and plug, B, open at its lower end, and provided with the beveled edge, b, substantially as described.

Third, The waste valves, a b, in combination with the plug, B, constructed and operating substantially as and for the purpose set forth.

58,846.—Water Wheel.—Adolphus Lind, San Francisco, Cal.

I claim, in combination with the stoppers, H H' H2, the stationary wheel, C, and revolving wheel, A, substantially as described.

58,847.—Identifying Mark for Casks and Boxes.—Edward A. Locke, Boston, Mass.

I claim a circular or other suitably shaped plate provided with identifying marks and having a lip turned down from its edge, substantially as described.

I also claim the employment of a circular or other proper shaped plate provided with such lip driven into the wood at the side of the cavity or depression in which the plate is inserted, substantially as described.

I also claim combining with such attaching plate, one or more rotary identifying rings or plates, operated in connection with the attaching plate, substantially as set forth.

I also claim confining the attaching and identifying plates or rings together, so that while held together they may be respectively rotated, substantially as described.

58,848.—Fence.—Lewis E. Lockling, Perrysburgh, N. Y.

I claim the combination of the standard, A, with the suspended twisted rod, C, with loops, a a, supporting the boards or rails, &c., of the panel, substantially as described.

I also claim, in combination with the above, the box, E, for holding the adjacent ends of the rails, etc., substantially as described.

58,849.—Joint for Railroad Bars.—Samuel M. Langley, Hudson, N. Y.

I claim the rail section or connection, C, having key ways, b b, and overlapping the rails at their top, in combination with the chair, D, and rails, A, reduced at their ends, the whole being united with keys, c, and constructed and arranged to establish the joint substantially as shown and described.

58,850.—Hose Coupling.—Silas H. Loring, Lawrence, Mass.

I claim, the expansion packing, Figs. 8 and 9, in combination with the dogs, H, and slots, C, in band, D, of Fig. 1, and the dogs, I, and slots, J, of Fig. 2, with the oval ring, L, and collar, M, for the purposes herein set forth and described.

58,851.—Clay-pipe Die.—George D. and Horace A. Goodrich, Joliet, Ill.

We claim the improvement in the machines of any construction used for the manufacture of pipes by which a rotary or spiral motion is given to the clay or other suitable material in the process of manufacture, consisting in the die, with its revolving core detached from the feeding shaft and placed upon a stationary shaft, and its funnel-shaped face plate, constructed and operating substantially as herein described and specified.

58,852.—Marble-polishing Machine.—James W. Maloy, Boston, Mass.

I claim, First, The reciprocating cylinder, B, when constructed and operating as and for the purpose described.

Second, The grooved sleeve, D, provided with a pawl, p, or its equivalent, as described.

Third, The combination of an inclined table or platform, H, with the cylinder, B, substantially as described.

Fourth, The combination of cylinder, B, grooved sleeve, D, and the means of connecting the same for joint operation, substantially in the manner and for the purpose specified.

58,853.—Machine for Cutting Granite.—James W. Maloy, Boston, Mass.

I claim, First, The combination of the revolving circular disk, C, with the sliding portion, B, of the table, as and for the purpose specified.

Second, I claim the combination of the sliding table, B, revolving disk, C, and tool, D, when constructed and operating substantially as set forth.

58,854.—Carriage Harrow.—T. J. Marinus, James Whait and William Whait, Independence, Iowa.

We claim the harrows, G G', in combination with the wheels, A A, and frame, C D D', rock shaft, F F', supporting link, H, and chains, I, M N, when the several parts are constructed and operated in the manner and for the purpose set forth.

58,855.—Plow.—James S. Marsh, Lewisburgh, Pa.

I claim constructing the mold board of a turn plow with an upper extension, b, having a concave depression, a, formed in it above the highest point of entrance into the ground, substantially as described.

58,856.—Reaping Machine.—James S. Marsh, Lewisburgh, Pa.

I claim, First, Arranging a seat, F', upon a beam which is supported upon the outer end of the axle of the driving wheel, to allow a person to ride and control the machine when a continuously revolving combined rake and reel is mounted upon it, substantially as described.

Second, The mode of attaching the seat beam, F, to the draft pole, in conjunction with a device which is applied to said beam for adjusting the hight of cut, substantially as described.

Third, The combination of a circularly sweeping rake or reel with a finger beam arranged substantially as described, so that the grain at the inner divider corner can be reached by the reel arms.

Fourth, The construction of the metal frame, C, with a shoe C', substantially as described.

Fifth, Adapting the metal frame, C, to support and serve as bearings for the spur wheels, c6, c6, and also for the rake and reel arms, substantially as described.

Sixth, Arranging the gearing which gives motion to the sickle upon a frame which is located on the grain side of the driving wheel and in advance of the raking and reeling attachment, substantially as described.

58,857.—Street Washer.—John McClelland, Washington, D. C.

I claim, First, The short case, B, as constructed in combination with the stop cock, A, pipes, C and D, top plate or cap, F, and key rod, G, as described for the purposes herein set forth.

Second, I claim the flanges, E E, on the case, B, which covers the stop cock, A, to prevent it from being moved or lifted up by the action of the frost from the top, as described.

58,858.—Carpenter's Bench.—Robert McConnell, Lawrenceville, Pa.

I claim, First, The bench vise consisting of the toothed slides, D E, jaws, F, double inclined parts, G and H, spring, J, armed catches, K L, bar, F, arranged and operating substantially as described for the purpose specified.

Second, Holding the toothed slides by means of the toothed catches, K L, provided with arms, K' l', operating substantially as described for the purpose specified.

58,859.—Vault Light.—M. J. McCormick, New York City.

I claim the adjustable plate, C, provided with openings, l l', the former being provided with lenses, l', in combination with the openings, a a', in the plate, A, the openings, a, being covered with glass plates, B, and the plate, C, fitted over the openings in the plate, A, and all arranged substantially as and for the purpose set forth.

I further claim the ledges or ribs, d d', provided with grooved or c ncave upper surfaces, when used in connection with the plates, A and C, substantially as and for the purpose specified.

58,860.—Wool Press.—O. C. McCune, Darby Creek, Ohio.

First, I claim the roller, L, provided with the slotted teeth, b, for the purpose of tying wool, substantially as herein described.

Second, I claim, the lever, G, in combination with the roller, L, lever, O, and slotted, teeth, b, substantially as and for the purpose described.

Third, I claim the strap, D, in combination with the roller, L, and teeth, b, substantially as herein set forth.

58,861.—Apparatus for Carbureting Air.—James McGeary, Salem, Mass.

I claim the casing, A, for liquid hydro-carbons, in combination with the pipe for conducting the gas or air into such casing to act upon the hydro-carbons, when such a pipe terminates in a perforated dome, D, substantially as and for the purpose described.

I also claim the vertical tubes, G, in combination with the above, substantially as and for the purpose specified.

I also claim the surrounding cylinders or casings, I and M, with the outer one, M, covered with a web, O, in combination with the pipe, P, terminating in a dome, D, with or without the vertical tubes, G, substantially as described and for the purpose specified.

I also claim feeding the liquid hydro-carbons to the web covering of the perforated cylinder at a point near the bottom of the cylinder, I, substantially as and for the purpose described.

58,862.—Coal-oil Stove.—E. McKinney, Clarkville, Tenn.

I claim the feeding or supplying of petroleum to stoves or furnaces by means of water or other fluid of a greater specific gravity than the petroleum, placed in an elevated tank or reservoir above the petroleum chamber, and communicating with the latter in such a manner as to feed the petroleum to the fire pan, or chamber by static pressure, substantially as described.

58,863.—Furnace.—James H. Mearns, Philadelphia, Pa.

First, I claim the grates, P and J, in combination with the shaft, H, its arms, e e', and link, d, or their equivalent, the whole being arranged within the ash pit of a heater, and operating substantially as and for the purpose described.

Second, The flues or openings, m n, communicating with the ash pit and with the casing above the fireplace, for the purpose specified.

Third, The combination of the crank shaft, I, the sliding bars, l l, and the shaft, H, its arms, e e', and link, d, as and for the purpose set forth.

Fourth, The adjustable bar, K, in combination with the lower grate or sifter, J, substantially as and for the purpose specified.

58,864.—Apparatus for Supplying Liquor to Centrifugal Machines.—W. R. Meins, Boston, Mass.

I claim, for use with a centrifugal sugar-bleaching machine, a portable liquoring basket having a construction substantially as described.

58,865.—Hand Loom.—Daniel Mendenhall, Fairfield, Iowa.

First, I claim the sliding bracket, L, with its openings and wedge, M, and the pins, v v v v, all constructed and operating in the manner and for the purposes set forth.

Second, The combination and arrangement of the treadles, 1, 2, 3, 4, and the sub-treadles, x x x x, with the tappet cylinder, o, and jack, l, as and for the purposes set forth.

Third, The hinged levers, m m', and tappets, n n, in combination with the batten and with the locker arm, I, head, H, cords, g g, and picker staff, F F, said several parts being respectively constructed, and the whole arranged for use as described.

58,866.—Tree Protector.—Daniel Mendenhall, Fairfield, Iowa.

I claim the arrangement and combination of the parts herein described, constituting a fruit-tree protector, substantially as set forth and described.

58,867.—Eye-glass Suspender.—S. F. Merritt, New York City.

I claim, as a new article of manufacture, an eye-glass holder, consisting of the shank, A, spring hook, B, bars, C, eye, a, and pin, D, substantially as described for the purpose specified.

58,868.—Filter.—Charles F. Mietzsch, Philadelphia, Pa.

I claim a filter having two or more chambers or compartments containing filtering material, so arranged in respect to each other, to an outlet pipe and to a lower chamber, that the fluid to be filtered must pass downward through the material in one compartment to the lower chamber, and then upward through the material in the other chamber to the outlet pipe without rising above the surface of the filtering material in the second chamber, as and for the purpose described.

58,869.—Sorghum Evaporator.—David T. Miller, Dayton, Ohio.

I claim the evaporator, constructed, arranged, and operating substantially as and for the purpose set forth.

58,870.—Method of Protecting Rubber Articles.—J. R. Moffitt, Chelsea, Mass., and F. D. Hayward, Malden, Mass.

We claim protecting the surfaces of articles made of caoutchouc or gum elastic compounds by surfacing them, substantially as set forth.

58,871.—Ditching Machine.—Hiram E. Moon and Joseph Doan, Wilmington, Ohio.

We claim the ditching wheel, F, constructed with the cutters, f f, open throats inside thereof and projecting rim, s, bounding the whole outer periphery of the wheel, arranged and operating substantially as and for the purpose herein specified.

We also claim the cleaner, G, in combination with the ditching wheel, arranged and operating substantially as herein set forth.

We also claim the marking knives, S S, in combination with the ditching wheel, substantially as described.

We also claim the construction and arrangement of the cutting or penetrating guide wheel, F, feeding rope, N, anchor, H, and spool, E, substantially as and for the purpose herein set forth.

We also claim the rudder, T, provided with the bridge, t, for the purposes specified.

We also claim such a combined arrangement of the sweep gearing and ditching wheel that the twisting force of the power applied and the side draft of the machine shall counteract and nearly counterbalance each other, substantially as set forth.

58,872.—Mop Holder.—Wm. Morehouse, Buffalo N. Y.

First, I claim the combination of a loose and a fixed clamping jaw, the former being connected to the ferrule, B, of the latter by means of a hooked shank, b, substantially as described.

Second, I claim the construction of a ferrule, B, upon the shank of the jaw, A, for receiving the handle, C, and also the shank of the movable jaw, A', substantially as described.

Third, I claim the combination of a sliding collar, D, which is acted upon by a spring, c, with the fixed and movable jaws, A A', substantially as described.

58,873.—Wood-bending Machine.—Charles Moyer, Jr., Coopersburg, Pa.

I claim the link, e, in the flexible strap, C, to operate in combination with the former, A, and roller, a, or their equivalents, substantially as and for the purpose described.

58,874.—Roller for Clothes Wringers.—John Murphy, New York City.

I claim the fabric, C, mounted within the mass of gum so as to form a compound elastic roll, substantially of the character and for the purpose herein set forth.

58,875.—Whistle for Steam Engine.—John Murray, New York City.

I claim the sliding sleeve, H, the gimbal or levers, I K, the post, O, and spring, P, when in combination with the whistle of a steam or other engine, substantially as and for the purposes described.

58,876.—Corn Planter.—Carlisle C. Myers, Sterling, Ill.

I claim the levers, F, provided with lips, g, mounted upon the outside of the tubes, f, and operating in connection therewith, and with the slides, E, as and for the purpose set forth.

58,877.—Car Brake.—David Myers, Chicago, Ill.

First, I claim controlling the movements of the sliding block, B, by means of oscillating levers, F, substantially as and for the purposes shown and described.

Second, I claim operating the levers, F, by means of the arms, H, friction wheels, G, and springs, I, for holding the arms upon the said wheels, substantially in the manner and for the purposes specified.

Third, I claim the combination of the above-mentioned parts with the sliding block, B, and the cord, b, connected with the apparatus beneath the car, arranged and operating substantially as specified and for the purposes set forth.

Fourth, I claim in combination with the above, the arrangement of the ball, and operating substantially as and for the purposes shown and described.

58,878.—Mortising Machine.—Walter Naugel, Philadelphia, Pa.

First, I claim operating the rotary reciprocating cutter head, M, through the medium of the bars, L L, connected to the cutter head and cross head, K, as shown and actuated by the segment rack, H, and the pinion, I, on the shaft, J, or their equivalents, substantially as and for the purpose set forth.

Second, The attaching of the guides or ways, g g, of the bed, P to adjustable parallel bars, S S', arranged substantially as shown and described, for the purpose of adjusting the stuff, E, to be mortised in a proper relative position with the cutter head.

58,879.—Caster for Furniture.—Hezekiah Naylor, Pekin, Ill.

I claim a caster in which the caster ball, B, turns on three friction balls, C, which are placed in the angles of an equilateral triangle, turning on journals which have bearings on both sides of said balls, in recesses formed for the purpose in the top of the caster, substantially as described.

58,880.—Drop Press.—Joseph P. Noyes, Binghamton, N. Y.

First, I claim the arrangement of the lever catch, d, shoe, e, and arm, b, in combination with the drum, G, crank shaft, C, and hammer, I, constructed and operating substantially as and for the purpose described.

Second, The spring top, K, in combination with the lever catch, d, drum, G, and hammer, I, constructed and operating substantially as and for the purpose set forth.

58,881.—Beehive.—W. H. Pierson, West Jersey, Ill.

I claim the combination and rearrangement of the case, A grooved and perforated partitions, a, breeding boxes, B, with perforation, b, spare boxes, D, with perforations, c, entrance, f, box, E, alighting board, a', tube, F, and tube, G, substantially as described as and for the purpose specified.

58,882.—Egg Beater.—Charles Pinder, Lowell, Mass.

I claim the combination with the case, A, and cover, B, of the hoops or strips, C C (two or more), the latter so arranged as to accomplish the purposes herein specified.

58,883.—Car Coupling.—Thos. D. Powers, Rochester, Wis.

I claim the sliding block, G, having the guide springs, A B, attached, the pivoted lever, D, with the bolt, C, attached, and the spring catch, F, when arranged to operate as shown and described.

53,884.—Suspended.

58,885.—Dress Guard for Carriages.—George W. Raite, Cincinnati, Ohio.

I claim an extensible guard or screen for attachment to carriages, substantially as set forth.

58,886.—Tool for Cutting Boiler Tubes.—F. Ramsey and James Miller, New York City.

First, We claim the combination of the shank, D, screw shaft, M, with tapering end, F, cap, J, cutters, L L, and spring, N N, constructed and operating substantially as described for the purpose specified.

Second, The flanged adjustable collar, O, in combination with the shank, D, substantially as and for the purpose specified.

58,887.—Machine for Making Spikes.—John O. Reilley, Baltimore, Md.

First, In combination with the vertically moving dies, U and f, and the levers, W N, I claim the pivoted arms, Y c, operating substantially as described and represented.

Second, The gage, K, arranged in relation to the moving die, D, and the header, as described.

Third, In combination with the moving die, C, adjustable for various lengths of spikes, I claim the cutter, O, arranged in ways alongside the stationary die, and operating against the plain face of the moving die after the iron is gripped between the dies, substantially as described.

58,888.—Water Elevator.—A. O. Remington and V. R. Stewart, Weedsport, N. Y.

We claim the stationary pulley, F, fitted loosely on the shouldered axle, E, B, but without lateral motion, operating in combination with the sliding collar, I, and lever, L, whereby the bucket will be elevated or lowered in a line vertical to the pulley, F, in the manner substantially as and for the purpose specified.

58,889.—Cork Extractor.—C. Rosenberry, Chicago, Ill.

I claim the sliding wire, A, with its ring, B, for the purpose of closing or loosening the claw, M, in combination with the same, the whole constructed and operating in the manner herein described and specified.

58,890.—Medicine for Hog Cholera.—William M. Runyon, R. H. Haller, and D. B. Morris, Oskaloosa, Iowa.

We claim a composition of matter, compounded of the above ingredients or their chemical equivalents, and prepared for use substantially in the manner and for the purpose set forth.

58,891.—Revolving Cylinder Engine.—Chas. F. Ruset, Communipaw, N. J.

I claim the combination of the wheel or drum, C arranged to

rotate on suitable bearings, engineer carried by said drum with their revolving shafts, G, hung therein and arranged relatively to the driving axis as described, pinion wheels, H, and stationary circular rack or cog wheel, I, substantially as shown and described.

58,892.—Chimney.—Cyrus W. Saladee and T. R. Eddy, Newark, Ohio.

First, We claim constructing chimneys for houses of hollow sections, made of fire-proof clay or other similar material, and joining or cementing the same together in the manner and for the purpose substantially as shown and described.

Second, We claim the manner, shown and described, of making each separate floor of the building sustain its proportion of the weight of the chimney, substantially as and for the purpose specified.

Third, We claim the base, B-1, on the top section, E, of the chimney (Figs. 1 and 2, plate 1), for the support of the chimney top, F, in the manner and for the purpose substantially as shown and described.

58,893.—Lamp Burner.—John F. Sanford, Keokuk, Iowa.

First, I claim such a construction and arrangement of parts, that while they admit of the sharpening of the spurs of the wheels which move the wicks, will also permit the lighting of the lamps through apertures in the cages of the burners without the necessity of contrivances for depressing the wicks for that purpose, substantially as above described.

Second, In combination with apertures through the cage of a lamp burner, so constructed and arranged as to admit the sharpening of the spurs upon the wheels which move the wick without moving or displacing any of the parts, I claim a contrivance for causing those spur wheels to engage with the wick, substantially as and for the purpose above described.

58,894.—Breast Pin.—Lorenzo Sauter, Jersey City, N. J.

I claim the centrally pivoted shield, B, furnished with openings as described, and combined with the body, A, provided with suitable ornaments, substantially as herein set forth for the purpose specified.

58,895.—Dish Washer.—James J. Sawyer, Woodstock, Conn.

First, I claim the resting lips, B, on the bottom plate, C, of the receptacle, A, arranged to operate with the floats, G, therein, as described, for the purpose specified.

Second, The removable false bottom, K, in combination with the receptacle, A, as described for the purpose specified.

58,896.—Piano-forte.—Peter Schuler, Philadelphia, Pa.

I claim securing the sound board of a piano between elastic or compressible bearings, c1, c2, so that one end of the same may slide between its bearings, substantially in the manner described and set forth for the purpose specified.

58,897.—Wagon-bow Fastening.—Amos R. Scott, Bethel, Ohio.

First, I claim the upper fastening, E, and the lower fastening, F, G, E, B, I, when said fastenings are constructed and arranged substantially as described, in combination with the bow of a wagon, for the purpose set forth.

Second, Tightening the bow upon the wagon body by means of a lever and cam or eccentric, substantially as described and for the purpose set forth.

58,898.—Lock.—William Sellers, New York City.

I claim the bolt, B, with the rib, f, constructed as shown in Figs. 4, 5 and 6 of the drawings, and arranged to operate with the oblong slotted plate, g, for the purpose herein specified.

58,899.—Fruit Box.—John T. Severns, Burlington, N. J.

I claim, as a new article of manufacture, fruit boxes, the sides of which are formed by a single piece of thin steamed wood, having rounded corners formed by two or more internal kerfs sawed partly through the board and bottom, constructed and inserted substantially as set forth.

58,900.—Rotary Engine.—Simeon Sherman, Weston, Mo.

I claim the spring, W, arranged as described and shown.

I claim the arrangement of the condenser in direct connection with the two exhaust ports, guarded by a reciprocating rotary abutment valve.

I claim the described arrangement of the rotary engine, condenser and chambered valve, T, operating as described.

58,901.—Rubber for Dental Purposes.—Edwin L. Simpson, Bridgeport, Conn.

I claim combining the within described vulcanizing compound with india-rubber, in the proportions herein named, and substantially in the manner and for the purpose specified.

58,902.—Manufacture of India-rubber, Gutta-percha, etc.—Edwin L. Simpson, Bridgeport, Conn.

First, I claim the herein-described compound of vegetable oil, sulphur and benzoin gum, prepared substantially as and for the purpose specified.

Second, I claim combining the herein-described compound with india-rubber, gutta-percha, or other similar gum or gums, substantially as and for the purpose specified.

58,903.—Bobbin for Spinning Machines.—Charles Thomas Smith, Utica, N. Y.

I claim a filling bobbin, the tube or barrel of which is formed or manufactured of sheet zinc, with a wooden head or flange, as above described, the bore of the barrel at its tip being made tapering, in the manner and for the purposes herein set forth.

58,904.—Puddling Furnace.—Jacob Snyder, Wheeling, W. Va.

I claim a puddling or boiling furnace with the bottom of its boiling chamber constructed of wrought iron in a single plate or otherwise, substantially as described.

58,905.—Burning Fluid.—George W. Spangle, Clifton Springs, N. Y.

First, I claim the method above described for rendering any of the products obtained from petroleum inexplosive and safe as a burning fluid, by the use of sal soda and cream of tartar, substantially as above described.

Second, The removal of the unpleasant odor of any of the above-mentioned products, by the use of the oil of wintergreen, substantially as described.

58,906.—Water Wheel.—Frederick Speck, Waynesborough, Pa.

I claim the combination of the outer and inner wheels, as constructed and arranged together, whereby the water first passing through the buckets of the outer wheel acts directly upon the buckets of the inner wheel, substantially as and for the purpose set forth.

58,907.—Shade for Protecting the Eyes.—James F. Spence, Brooklyn, N. Y.

First, I claim the elastic clasp or band, A, in combination with the shade, B, substantially as herein set forth for the purpose specified.

Second, The construction of the shade, whereby a space is left for the passage of air between the shade and the forehead, substantially as herein set forth for the purpose specified.

58,908.—Seat and Desk.—David I. Stagg, New York City.

I claim the reversible and adjustable back, C, provided at one end with the desk and seat, D, and secured between the side pieces, A A, in combination with the adjustable seat, B, between the upright side pieces, A A, substantially as and for the purpose set forth.

58,909.—Machine for Cutting Stalks in the Field.—W. F. Starnes, Macomb, Ill.

First, I claim the roller, F, and the hooks, H, arranged as shown, to break down and straighten the stalks, as set forth.

Second, The reciprocating knife, K, operated by the crank shaft, D, and the gear wheels, F and C, for the purpose of cutting the stalks, as set forth.

58,910.—Railroad Signal.—Thomas Stead, Cleveland, Ohio.

First, I claim the herein-described arrangement of the posts, A B, in relation to each other, and the track, in combination with the lanterns, E and K, when constructed and operated as and for the purpose set forth.

Second, I claim the wheels, G and H, and chain, G', in combination with the post, B, and capstan, H', lever, I, and disk, I', when arranged and operated as and for the purpose set forth.

58,911.—Plow.—Carlisle St. John, Keosauqua, Iowa.

I claim a land side that may be changed end for end, on one end of which is a cutter so constructed that the cutter may be used or not, as desired, for the purposes and substantially as described.

Second, I also claim the corrugated plates, G1, and G2, the plate G1 being provided with a strap and socket, in combination with the beam, B, and brace rod, E, for the purposes and substantially as described.

58,912.—Machine for Grinding Cob and Corn.—Solomon Stuckey, Sugar Grove, Ohio.

I claim the construction of the conical cylinder and concave with their curved knives, G and H, and projections, K, so arranged as to cut and grind the cob and corn, as herein described.

58,913.—Hydrometer.—G. Tagliabue, New York City.

I claim a hydrometer having a lump of metal, or other suitable material, firmly secured to the inner surface of the bulb, substantially as and for the purpose described.

58,914.—Spring Bedstead.—S. H. Tift, Morrisville, Vt.

I claim the oblong box, A, as constructed with the top, C, with its permanent pins, D, straps, J, springs, E, and solid bottom, G, with its apertures, H, when arranged and combined, substantially as described and for the purpose set forth.

58,915.—Lamp-chimney Attachment.—Frederick John Tinker, Cincinnati, Ohio.

First, I claim the eccentrically slotted collar, B C, shifting catch, D E, and nut, F, combined and operating as set forth.

Second, I claim the provision of the concavity, c, on the under side, and notches, e', on the inner margin of the catch, E, for the purpose stated.

58,916.—Door Guard.—John Tinkey, New Haven, Conn.

I claim the combination of the bolt, C, constructed with flanges, d and d', so as to form shoulders on the said bolt keepers, E, constructed and arranged to operate substantially in the manner and for the purpose set forth.

58,917.—Chair.—Jacob Ungerer, Brooklyn, N. Y.

First, I claim the combination of the metal frame, B, with the metallic seat, A, substantially as and for the purpose described.

Second, I claim the springs and spring pads, a, in combination with the seat, A, and chair frame, C, and operating substantially as and for the purpose set forth.

58,918.—Communicating Reciprocating Motion to Pumps, etc.—Isaac Van Olinda, Brooklyn, N. Y. Antedated October 5, 1866.

I claim the forked and slotted arm, f, of the lever, E, and the slotted vertical guiding standards, I, applied in combination with each other and with the collar, F, pins, d, and friction rollers, l, substantially as herein set forth.

58,919.—Manufacture of Soap.—L. H. Van Spanckeren, Muscatine, Iowa.

I claim a soap compounded and prepared from the ingredients and in the manner substantially as set forth.

58,920.—Skirt Elevator.—H. A. Walter, Norwich, N. Y.

I claim the combination of the plate, A, tube, B, valve, D, having a concave part, c, lever, f, spring, g, hood, n, shield, l, all substantially operating as above described.

58,921.—Sawing Machine.—Charles R. Warner and Moses Bales, London, Ohio.

We claim the arrangement of the guide, R, rocking block, P reversible saw shaft, M, and reversible frame, D E F, when constructed as and for the purposes set forth.

58,922.—Toy Walking Figure.—Robert Weir, Cohoes, N. Y.

I claim combining the body and jointed limbs of a figure with a revolving axle, g, by means of crank pins, h h, and wire, W, or their equivalents, in such a manner as to produce an alternate bending of the knee joints and other movements of the limbs, substantially as herein described and set forth.

58,923.—Machine for Furrowing Corn Ground.—William H. Warwick, Dunlevy, Ohio.

First, In combination with the vertical plates or pieces, or runners, I claim the slide guards, f, for limiting the depth of the furrow, as recited.

Second, In combination with said pieces or runners, I claim the fender plates, l, constructed and operating substantially as described.

58,924.—Tube-sheet Cutter.—Theodore L. Webster, Brooklyn, N. Y.

I claim, as an article of manufacture, a tool for drilling metals, composed of a circular cutter and a yielding center, constructed and arranged in the manner described.

58,925.—Sewing Machine.—Albin Warth, Stapleton, N. Y.

First, I claim providing the oscillating arm, which takes up the slack of the needle thread, with an oblong slot, substantially as described, so as to keep the loop of the needle thread open to let the shuttle pass twice.

Second, I claim the needle, n, provided with a slotted shank, substantially as shown in Figure 2.

Third, I claim the rough-surfaced clamp, moving from below in opposition to the spring pressure foot above the goods, and operating substantially as described, to hold the material while the stitch is being finished.

Fourth, I claim the double-pointed shuttle, as shown in Figure 25, and arranged to work continuously in either direction.

Fifth, I claim the ridge, a', on that side of the shuttle which faces the needle, substantially as and for the purpose described.

Sixth, I claim the elastic center, c', operating as described, in combination with the revolving shuttle, constructed and operating substantially as and for the purpose described.

Seventh, I claim the circular ridge near the outer edge of the shuttle race, substantially as described, to allow the shuttle to clear its own thread and to leave the loop of the needle thread free to pass over the shuttle.

Eighth, I claim the button, k, provided with a series of notches in combination with a suitable stop or latch, and with the shafts, F F', and shuttle driver, H, constructed and operating substantially as and for the purpose set forth.

Ninth, I claim the back gear, M, in combination with the shafts, F F', shuttle driver, H, and needle, n, constructed and operating substantially as and for the purpose described.

Tenth, I claim the method herein described of producing a stitch by the combined action of the thread guide, I, revolving shuttle, S, and needle, n, operating together substantially as described and shown in Figures 4 to 7 inclusive.

Eleventh, I claim the method herein described of producing a stitch by the combined action of the thread guide, I', shuttle, S, and needle, n, operating together substantially as described and shown in Figs. 8 to 11 inclusive.

Twelfth, I claim the method herein described, of producing a stitch by the combined action of the reciprocating thread guide, I'', constructed as described, shuttle, S, and needle, n, the shuttle being passed twice through the same loop of the needle thread, as described and shown in Figs. 12 to 15 inclusive.

58,926.—Apparatus for Drying Peat.—Gustavus Wersenborn, New York City.

First, I claim forming a continuous drying table, by means of the cars, D D, which can be matched together, or used separately and arranged relatively to the side walls, B, and beds, A, or their equivalents, so as to convey the gaseous products of combustion from the furnace and to utilize the heat therefrom for the purpose of drying peat in lumps, or pulverized, substantially as and for the purpose herein set forth.

Second, I claim, in combination with the above, the flaps, D', arranged to operate substantially as and for the purpose herein specified.

Third, I claim the hollow stirrer, K L, adapted to transmit the heated fluid, and to impart the heat thereof to the peat, substantially as and for the purpose herein set forth.

Fourth, I claim the false bottom, I, arranged relatively to the cars, D, and to the several other parts, substantially as represented, so as to convey a heated fluid between them and the car bottoms, and to allow a portion to rise through the peat in the several cars, for the purpose herein set forth.

Fifth, I claim, also, to connect a series of cars with an iron pipe, or any other analogous means of transmission, so that the hot fluid may pass from car to car and through the wet material contained either upward or downward, or through the sides, substantially the same as specified.

Sixth, I claim the process, substantially as herein described, of forcing superheated or waste steam, or heated air, or waste heat from a furnace, through wet pulverized peat, for the purpose of drying it, as herein specified.

Seventh, I claim superheating the exhaust or waste steam from an engine, and heating air between the false bottom and the bottom of the cars, or on the sides, by the hot products whether the waste heat from a steam boiler, or of a furnace built for that purpose, as herein specified.

Eighth, I claim the means for forcing the cars together, the same consisting of the screws, O, or their equivalents, adapted to act on the whole series at a single operation, substantially as and for the purpose herein set forth.

58,927.—Railroad-car Box.—Isaac P. Wendell, Philadelphia, Pa.

First, I claim the combination of the oil box, E, with the box, A, and journal, B, arranged and operating substantially as described.

Second, I claim the combination and arrangement of the curved plate, F, with the oil box, E, and journal, B, substantially as described, so as to answer the triple purpose of an under-bearing for the journal, conducting the waste oil back into the oil box, and serving as a cover to said box to keep the oil in place, as specified.

Third, I claim the combination of the wedge, A, with the box, A, and oil box, E, substantially in the manner described and for the purpose set forth.

Fourth, I claim the elastic support, H, combined and arranged with oil box, E, and box, A, substantially in the manner described and for the purpose set forth.

58,928.—Method of Unloading Grain Cars.—D. J. Whittemore, Milwaukee, Wis.

I claim unloading cars by the arrangement of means constructed and operated substantially as herein recited.

58,929.—Keeper for Bolts.—C. M. Wood, Decatur, Ill.

I claim the providing of the keepers of bolts with oblong screw slots, in the manner substantially as and for the purpose set forth.

58,930.—Gate Hinge.—L. E. Woodward, Cohoctan, N. Y.

I claim elongating the eye or staple hole in the leg, D, so that the said leg will be allowed a longitudinal play upon the staple, substantially as and for the purpose specified.

58,931.—Machine for Washing Ores.—M. A. Woodside, Georgetown, Cal.

First, I claim the endless blanket, H, and receiving brush, K, when arranged substantially as described and for the purpose set forth.

Second, I claim the perforated feed box, I, and water pipe, J, substantially as specified and for the purpose set forth.

58,932.—Method of Quarrying Slate.—John E. Wootten, Cressona, Pa.

First, I claim the quarrying of slate and other like rock by the use of a circular saw or cutter caused to revolve on a portable and adjustable frame, and arranged for operating on the rock, substantially in the manner described.

Second, I claim the combination of the frame, A, its adjusting screw rods with casters, a, its driving engine and circular saw, G, the whole being arranged and operating substantially as and for the purpose herein set forth.

Third, I claim the spring, d, arranged on each screw rod between a collar, d, on the same, and the caster, a, substantially as and for the purpose described.

58,933.—Wood-sawing Machine.—Isaac Allard (assignor to himself and R. G. Turner), Belfast, Me.

First, I claim the pivoted angular lever, J, frame, F, spring catch, c, and connecting rod, K, arranged and operating substantially as described, for the purpose specified.

Second, I claim the pivoted vent dog, O, rod, Q, rod, R, and toothed bar, T, constructed and operating substantially as and for the purpose specified.

58,934.—Steam-generator Safety Valve.—Horatio Anderson (assignor to himself and Geo. W. Cushing), Chicago, Ill.

First, I claim the capsular spring, c, combined with the valve, B, the valve stem, s, and the jam nuts, b b', constructed and arranged as and for the purpose herein described.

Second, I claim the flange, A, and stand, b, combined with the valve, B, and the capsular spring, c, constructed and arranged as and for the purposes herein specified.

58,935.—Process for Bleaching Fibrous Materials.—Hayden M. Baker (assignor to A. M. Hastings and Alexander McVean), Rochester, N. Y.

I claim the application to the bleaching of fibrous or other substances of chlorine, hydrogen, oxygen and sulphurous acid gases in a close vessel under their own pressure while in a nascent or free state, in the manner herein described and set forth, or any other processes substantially the same, and which produce the same intended effects and results herein described.

I also claim the use of carbonic (or any other) acid under pressure for the purpose of decomposing chloride of lime in a close bleaching apparatus, in the manner herein described, or any other substantially the same, and which produces the same intended effects.

I furthermore claim the application of oxygen, hydrogen and sulphurous acid under pressure in bleaching.

58,936.—Lid Supporter.—James C. Barlow (assignor to himself and J. B. Hamilton), Brimfield, Mass.

First, I claim the pointed lid supporter attached by its ends respectively to lid and box on the edges of their sides, constructed and arranged substantially in the manner and for the purpose set forth.

Second, I claim the manner of arranging the pieces and joints so that they fold up out of the way when the lid is shut down.

59,937.—Magazine Fire-arm.—George W. Briggs (assignor to Oliver F. Winchester), New Haven, Conn.

I claim constructing and arranging the tube or magazine in combination with the barrel of the arm and the carrier block, so as to be operated substantially as and for the purpose specified.

58,938.—Shingle Machine.—A. M. Connett (assignor to J. C. Moore and Sarah A. Connett), Madison, Ind.

I claim splitting, shaving, tapering and jointing a shingle by one operation by means of a splitter knife, L, lower stationary knife blade, K, upper movable knife blade, I, and side knife blades or cheeks, M and P, in combination with suitable feed

rollers, when they are all arranged together so as to operate and be operated substantially in the manner described.

I also claim the stationary knife blade, F, in combination with the splitter blade, I, substantially as and for the purpose specified.

I also claim the adjustable piece, T, secured to the under side of the splitter blade, substantially as described for the purpose specified.

58,939.—FRUIT BOX.—W. H. Earle, Vineland, N. J., assignor to himself and G. M. Buttrick, Barre, Mass.

I claim the combination with the upper corners of a box, the sides and bottom of which are made as described, of the metal corner fastening pieces, F, substantially as shown and described.

58,940.—SCHOOLBOY'S BOOKBINDER.—Thos. Goodrum (assignor to Albert T. Manchester), Providence, R. I.

I claim a portable book package binder, constructed and operating as described, the article being substantially as herein specified.

58,941.—BRICK KILN.—E. Harrison, A. Wagner and A. Nulsen (assignor to Nulsen & Co.), Cincinnati, Ohio.

We claim, First, The method substantially as described of burning bricks, etc., by the contact of falling coal dust or other comminuted fuel, with a draft of air which has become heated by traversing the already burnt brick.

Second, The arrangement of the continuous gallery, A B, A' B', shifting partitions of partitions, D D', and dampers, G1 G2, and so forth, or devices substantially equivalent; whereby the operations of pre-heating, burning and cooling are simultaneously and continuously performed, in the manner substantially as explained.

58,942.—LANTERN.—John O. Harris (assignor to himself and Israel S. Ritter), Reading, Pa.

I claim the conical base, B, attached to the lower part of the glass globe, A, of the lantern, and having a flange, C, at its lower end perforated with holes, a b, in combination with the cap, E, and jacket, F, at the top of the glass globe, A, all arranged substantially as and for the purpose set forth.

58,943.—ELECTRIC GAS STOP COCK.—John A. Heyl, Boston, Mass., assignor to himself and George Bailey, Hudson, Mass.

I claim the above explained improved cut-off, consisting of the stationary cylinder, G, and the rotary tube, E, provided with passages, a b, arranged in them as described, in combination with the ratchet, F, and the gas burner conduit, the whole being substantially as and for the purpose and to operate as hereinbefore explained.

58,944.—MANUFACTURE OF PAPER.—George W. Huribut (assignor to himself and Abram C. Wicker), Fair Haven, Vt.

I claim the use of pulverized clay, slate and other suitable stone as a material in the manufacture of paper, to give it body, evenness and finish.

58,945.—BRAKES FOR COTTON LAPPERS.—Daniel Hussey, Nashua, N. H., assignor to Richard Kitson, Lowell, Mass.

First, I claim the employment of the arm, E, and pinion gear, F, in combination with the bevel gears, C and C2, and ratchet wheel, A, all arranged to operate substantially in the manner and for the purpose set forth.

Second, I claim the gear, D, on the shaft, B, in combination with the bevel gears, C and C2, pinion, F, and arm, E, when the said gear engages with the pinion, J, to operate said pinion and its connections, substantially in the manner and for the purpose set forth.

Third, I claim the ratchet wheel, H, or its equivalent, in combination with the friction pulley, I, and friction weight, L, arranged and made to operate substantially in the manner, by the means and for the purpose set forth.

Fourth, I claim the lever, G, on the shaft, B, when the said lever is formed, arranged and combined with the pulley, I, ratchet wheel, H, and friction weight, L, substantially as and for the purpose specified.

Fifth, I claim the connecting rod, m, or the equivalent thereof, in combination with the arm, I, cross lever, M, and a weight or spring, P, all arranged to operate substantially as and for the purpose specified.

Sixth, I claim the spring, R, in combination with the ratchet wheel, H, pulley, I, and friction weight, L, and arranged to operate substantially in the manner and for the purpose explained.

Seventh, I claim the combination of the ratchet wheel, A, bevel gear, C, arm, E, pinion, F, bevel gear, C2, spur gear, D, lever, G, with arms, K and I, ratchet wheel, H, or equivalent, the pinion, J, friction pulley, I, friction weight, L, connecting rod, m, lever, M, weight or spring, P, with the shaft, B, the whole arranged to operate substantially as and for the purpose set forth.

58,946.—COFFEE MILL.—J. G. Lane (assignor to himself and W. J. Lane), Washington, N. Y.

I claim having the outermost ridge, h', of the grinding surface of case, A, solid or without being notched and extending around the outermost ridge, f, of the corresponding grinding surface on plate, B, so as to serve as a barrier to the too free discharge from the mill of the substance being ground, substantially as herein set forth.

58,947.—WOOD-TURNING LATHE.—James E. F. Leland (assignor to H. A. Leland), New York City.

I claim the slide, B, carrying the material to be turned, cam or eccentric wheel, H, sliding tube, I, concentric tube, J, having cutters, N, when all arranged together, substantially in the manner and for the purpose described.

58,948.—HINGE FOR MOLDERS' FLASKS.—E. C. Little (assignor to Eveline Little), St. Louis, Mo.

I claim the projecting wing, b, and pintle, c, in combination with the male half of the hinge plates, and the female plate with notched corner, and its edge, d, operating together the plates adapted to lie on the corner edges of the cope and drag, substantially as described for the purpose specified.

58,949.—ADJUSTABLE FRAME FOR FORMING HOOP SKIRTS.—Henry S. Loper (assignor to Collins, Peck & Co.), New Haven, Conn.

I claim the combination of the band block, B, adjustable upon its support, C, with the bars, D, adjustable in the band block and upon the base, substantially in the manner and for the purpose herein set forth.

58,950.—PIANO-FORTE.—Wm. H. Mason, Boston, Mass., assignor to himself and H. K. W. Palmer, Chelsea, Mass.

I claim the combination of the lever, H, and its flexile connections, a a, with the two octave keys of a piano-forte.

I also claim the combination and arrangement of the tongue, I, with the lever, H, its flexile connections, a a, and the two octave keys of a piano-forte.

58,951.—SOD CUTTER.—Silas A. Moody (assignor to Philip E. Divine), San Francisco, Cal.

I claim a series of circular blades or knives upon a shaft or axle arranged to rotate, as described, in combination with the cover, C, and seat upon the cover, substantially as described.

58,952.—INK-WELL COVER.—George Munger (assignor to himself and J. W. Shermerhorn), New York City.

I claim the semicircular sockets, b or b', in the bracket or disk in combination with the gudgeons, a, cast solid with the cover, A, substantially as and for the purpose described.

58,953.—MODE OF SINKING WELL TUBING.—R. F. Osgood, Rochester, N. Y., assignor to C. W. Kinne, Cortland, N. Y.

I claim the combination of the spiral wing or wings, b, with the shank, B, and tubing, A, operating substantially as and for the purpose herein set forth.

58,954.—EYELETED BRACE.—Samuel J. Shaw (assignor to himself, Thomas Corey, and Wm. E. C. Worcester), Marlboro', Mass. Said Worcester assigns to said Shaw his right.

I claim as a new article of manufacture for purposes as set forth the eyelets and brace struck or stamped together or in connection from one piece of metal.

58,955.—BRACE AND LACING DEVICE.—Samuel J. Shaw and W. E. C. Worcester (assignors to themselves and Thos. Corey), Marlboro', Mass. Said Worcester assigns to said Shaw his right.

We claim the combination of the metallic stay as made with the lacing holes and the arrangement of the lacing so as to go through such holes or eyelets serving to fasten the stay to the upper, the whole being substantially as described, whereby such lacing is made to protect the stay from being torn or separated from the shoe while in use.

58,956.—CAR BRAKE.—C. W. Singer, Anderson Store, Va., assignor to himself and Abel Land, Rochester, Ohio.

I claim, First, The rollers, D D', in combination with the adjustable rubbers, A, and springs, K, arranged in the manner and for the purpose set forth.

Second, I claim hinging the rubbers to the truck plates or frame so as to form inclined planes, thereby allowing the rollers to act as a wedge between the rubbers and plate, A, to compress the said rubbers upon the wheels and so that said rollers will move back independently on releasing the brake from the wheels, as and for the purpose set forth.

58,957.—WASHING MACHINE.—Josiah Stubbs, Decatur, Ill., assignor to himself and H. E. Foster, Macon county, Ill.

I claim the combination of the corrugated floor, E, gravitating beater, F, and closed rocking box, A B E, all constructed and arranged to operate in the manner and for the purposes set forth.

58,958.—MACHINE FOR DRESSING WILLOW FOR BASKETS.—Matilda C. Root, Harris Colt, and Elisha Colt (executors of E. K. Root, deceased), Hartford, Conn.

We claim the employment, in combination with the shaving mechanism, of a rotary carriage or bed to which the foremost end of the switch is fastened and by which the switch is pulled or drawn by the cutters during the shaving operation, as hereinbefore described.

58,959.—KEYED MUSICAL INSTRUMENT.—Hubert C. Baudet, Paris, France.

I claim, First, The locks, a', attached to and in combination with the strings of a musical instrument, substantially as and for the purpose herein specified.

Second, I claim the friction rollers, d, in combination with the locks, a', substantially as and for the purpose herein specified.

Third, I claim the combination with the rollers, d, or their equivalents, strings, a, and locks, a', of one or more driving cylinders, b c, and a system of keys, f, the whole operating substantially as herein specified.

58,960.—ELECTRO-MAGNETIC ENGINE.—Auguste P. Berlioz, Paris, France.

I claim, First, The shaft, F, divided into two insulated parts, turning in insulated boxes, D D', and connected to the bobbin wire or wires, t, all substantially as and for the purpose described.

Second, I claim the combination of the above and the disks, G, their bobbins, I, and the rings, n n', when the wires on said bobbins are connected to the shaft, to each other, and to the said rings, substantially as shown in Figs. 2 and 5, for the purpose specified.

Third, I claim the spring, o, its projection, n, and the roller, m, in combination with a ring, H.

Fourth, I claim the spring, o', its projection, m', in combination with a ring, H'.

Fifth, I claim the combination with two or more machines constructed as described, when the said machines are so arranged that when their axles are coupled, by the within described devices or their equivalents, alike currents will be simultaneously generated in all the machines.

58,961.—PURIFYING AND SOFTENING WATER.—Servaas De Jong, Paris, France.

I claim purifying and softening water by silicate of soda and carbonate of soda, or its equivalent, as set forth.

58,962.—STEAM SAFETY VALVE.—William Naylor, Lorn Terrace, Mildway Park, Eng.

I claim the arrangement, substantially as hereinbefore shown and described, in safety valves of bent levers of the first order acting in combination with a spring or springs, the whole operating in the manner and for the purpose set forth.

58,963.—MACHINERY FOR FORGING PIPE JOINTS AND OTHER ARTICLES.—James Alfred Shipton and Robert Mitchell, Wolverhampton, Eng.

We claim the construction and arrangement of machinery or apparatus for shaping and forging metallic articles, substantially as hereinbefore described and illustrated by figs. 1, 2 and 3, of our drawings.

REISSUES.

2,375.—APPARATUS FOR CARBURETING GAS.—J. F. Boynton, Syracuse, N. Y. Patented Sept. 5, 1865.

I claim, First, In an apparatus for carbureting gas, by charging it with the vapors of hydro-carbon liquids, the use of wood, as a capillary agent, to draw up the liquid and expose it to evaporation.

Second, In a carbureting apparatus as above described, I claim the use of wood in combination with cotton wicking or other fibrous material, to produce the capillary action necessary to promote rapid evaporation, substantially as described.

Third, I also claim so arranging and constructing the cotton wicking or other fibrous material, and its wooden supports, that as the surface of the liquid in the carbureting vessel descends, the number of capillary pores brought into action will be all the while increasing, substantially as described.

Fourth, I also claim a combination of wood and wicking, or other fibrous material, so arranged as to form a movable frame or cage, setting into a box, and producing a compound of capillary action of porous and fibrous material, substantially as described.

2,376.—APPARATUS FOR CARBURETING GAS.—John F. Boynton, Syracuse, N. Y. Patented Sept. 25, 1866.

I claim, First, The automatic filling reservoir, D, in combination with the tube, C, substantially as described.

Second, The base board, H, in combination with a series of wooden pegs inserted therein, and supporting fibrous material, to produce a compound capillary action, as and for the purposes described.

Third, I claim the wooden pegs, I, wound with cotton wicking, J, or other equivalent fibrous material to produce a compound capillary action as described.

Fourth, I claim the base board, H, wooden pegs, I, and cotton wicking or other fibrous material, J, so combined, constructed and put together, as to form a movable frame or cage which may be inserted into the carbureting box and removed therefrom, together, as one entire structure.

Fifth, I claim securing the fibrous material at the lower end of the pegs, by driving it with the peg into a perforation of the base board, substantially as described.

Sixth, I claim the internal box, K, with its partitions, K', constructed and arranged substantially as described.

Seventh, I also claim so constructing and arranging said internal box, K, that when set in the main carbureting box it will divide the carbureting chamber into an outer and inner apartment, substantially as described.

Eighth, I also claim constructing said box, K, with its partition walls of wood or any other porous substance which will produce capillary action.

2,377.—GAS BURNER FOR COOKING, ETC.—Adolph Geise, Buffalo, N. Y. Patented Nov. 28, 1865.

I claim, First, The draft and mixing chamber, A, in combination and arrangement with the perforated dome, D, perforated shell, c', and metallic base, A2, including gas pipe, F, for the purposes and substantially as described.

Second, In a gas burner for cooking and heating purposes, I claim the thimble, C, in combination with the wire gauze dome, D, substantially as described.

Third, The combination of the thimble, C, wire gauze dome, D, cap, E, substantially as set forth.

Fourth, The combination of the outer thimble, c, the inner and upper thimble, c, and dome, D, for the purposes and substantially as set forth.

2,378.—LOOM.—Benjamin Oldfield, Newark, N. J Patented Jan. 23, 1866. Antedated Jan. 17, 1866. (Div. A.)

I claim the application to a batten of two or more shuttles for plain weaving, and one or more figuring shuttles, to operate in conjunction, substantially in the manner and for the purpose herein set forth.

2,379.—LOOM.—Benjamin Oldfield, Newark, N. J. Patented Jan. 23, 1866. Antedated Jan. 17, 1866. (Div. B.)

I claim an upright shuttle driven by rack and pinion or in any other suitable manner and which is grooved on each of its sides, and the body part of which is cut away for the quill and provided with a guard, g, substantially in the manner and for the purpose herein set forth.

2,380.—Suspended.

2,381.—METHOD OF OPERATING CUT-OFF VALVES.—G. H. Reynolds and M. A. Hinckley, Mystic Conn., Admstr. to D. B. Hinckley, assignee of G. H. Reynolds. Patented Feb. 3, 1857.

First, I claim automatically shutting a cut-off valve carried on the steam valve, so that so soon as the valve commences to close it will continue its closing motion independent of the motion of the engine, substantially as and for the purposes herein specified.

Second, I claim the inclined dogs, H H, arranged to operate in connection with a cut-off valve, F, carried on the steam valve, B, substantially in the manner and for the purpose herein set forth.

DESIGNS.

2,494.—PAPER HANGINGS, ETC.—Charles Husband, Taunton, Mass.

Inventions Patented in England by Americans.

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2,224.—REPEATING FIRE-ARM.—Oliver F. Winchester, New Haven, Conn. Dated Aug. 29, 1866.

2,226.—SOFTENING, DISINTEGRATING, AND BLEACHING VEGETABLE FIBRES.—James M. Mellor, New York City. Dated Aug. 30, 1866.

2,242.—MACHINERY FOR HULLING AND CLEANING COFFEE AND OTHER BERRIES OR SEEDS.—William V. V. Lidgerwood, a citizen of the United States, now Charge des Affaires at Rio de Janeiro, Empire of Brazil. Dated Aug. 30, 1866.

2,247.—APPARATUS FOR BORING BOILER TUBE HEADS, DRILLING ANGLE HOLES, OR CUTTING CIRCULAR GROOVES IN METALLIC SUBSTANCES.—James Miller, New York City. Dated Aug. 31, 1866.

2,264.—HOOP SKIRT.—Augustus J. Colby, New York City. Dated Sept. 5, 1866.

2,265.—STEAM JET.—David M. Nichols, New York City. Dated Sept. 17, 1866.

2,289.—FELTING OR SIZING HAT BODIES, AND MACHINERY THEREFOR.—Philip W. Somers, Danbury, Conn. Dated Sept. 17, 1866.

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PARIS EXPOSITION. DR. THOMAS W. EVANS, Of Paris, proposes to make for the EXPOSITION UNIVERSELLE, To be held in Paris in 1867, a collection of material, which may serve to illustrate the surgical and sanitary history of our late war, as well as indicate the present condition of surgical mechanism in this country. The Exhibition will be made in concurrence with the Geneva International Committee, and the French Central Committee (for the amelioration of the condition of the wounded upon the field of battle), and will be competitive with similar collections formed under the direction of other national committees. I would, therefore, call the attention of all interested in hospitals, hospital tents, hospital furniture, ambulances, medicine wagons, surgical instruments, or any other military or civil surgical appliance, to a plan which will secure for those articles or plans, or models of the same, the best possible exhibition, free of any expense to the contributor. When articles are costly, or of peculiar interest, or are likely to prove of special value in such a collection, a portion of the actual cost of such articles may be assumed by the subscriber, who may be addressed, for additional information, at No. 19 William street, New York, care of George H. Mercer. 16 3*] EDWARD A. CRANE.

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Mr. Joseph Harrison, Jr.: Dear Sir:—I will say in reply to yours of the 9th inst., that I have had one of your Boilers almost in constant use over one of my Puddling Furnaces for over eighteen months, and in all that time it required no repairs, with the exception of changing a few light bolts for heavier ones, and it is now running without any signs of leaking or want of repair, apparently as good as when first put up. I think I have just grounds, from the experience I have had, to recommend them as a good and safe boiler, and one that generates steam very fast. I feel confident that I get nearly double the quantity of steam from this boiler that I do from any other Puddling Furnace in my Mill that has two Cylinder Boilers over them. I believe the day is not far distant when they will be in general use in Iron Manufacturing establishments. Yours respectfully, STEPHEN ROBBINS. Artisan Hall, 611 and 613 Sassom street, Philadelphia. Mr. Joseph Harrison, Jr.: Dear Sir:—We take great pleasure in testifying to the merits of your Boiler, as a generator of steam, the confidence we have in its safety, its economy of fuel, and also of space for its erection. It has now been in successful operation more than a year, without the necessity of any repairs, and our confidence increases with its use. We shall always consider it a privilege to exhibit and explain its merits to any who may wish to examine it. Respectfully, etc., GEO. W. SIMONS, BRO. & CO. Philadelphia, Aug. 9, 1866. Mr. Joseph Harrison, Jr.: Dear Sir:—In reply to your communication respecting our opinion of the "Harrison Boiler," we would state as follows: We have had one of your Boilers in constant use for twenty-two (22) months, during which time it has supplied steam to a Horse Engine, driving about seven lathes and several other power tools. It is perfectly tight and free from leakage; takes up less room than an ordinary Boiler; and as to its economy in fuel, you can best judge for yourself, from the following statement: During the past year it has burned from 80 to 90 tons Pea Coal, each week averaging 6½ to 7 days. We can truly recommend said Boiler, from our own experience, as safe, reliable, and economical. Truly yours, TAWS & HARTMAN, 1237 North Front street. Office of the Salem Coal Company, Philadelphia, August 10th, 1866. Joseph Harrison, Jr., Esq.: Dear Sir:—After having your cast-iron Boiler in use at the Colliery of this Company for more than a year, it gives me pleasure to state that its operation has been very satisfactory. In the important point of economy of fuel it is reported to be superior to any other Boiler we have in use, and as regards its safety from destructive explosion, it certainly has no equal among all the various forms of boilers that have come under my notice. Very truly, JNO. C. CRESSON, Pres't. Germantown, Aug. 16, 1866. Mr. Joseph Harrison, Jr.: Dear Sir:—About four months ago, we put in one of your "Harrison Boilers," and it gives us much pleasure to be able to state that, as a safe steam generator, in its general economy in fuel, time, etc., we consider it the best Boiler now in use. Our Boiler is 50 horse-power; our Engine has a 10-inch cylinder, with a 36-inch stroke; the cost of running this, and almost always at its utmost capacity, is about two dollars per day. In fact, we consider your Boiler so excellent in its services, aside from its safeness from explosion and its real economy, that we could not and would not do without it. It will afford us much pleasure to show the "Harrison Boiler" to any one who may call at our Works, where they can daily see it in practical operation. Very truly yours, etc., NELSON, CROOK & CO., Manufacturer of Edge Tools, Hammers, etc., Armat-st., Germantown, Philadelphia. New York, August 15th, 1866. Mr. Joseph Harrison, Jr., Philadelphia, Pa.: Dear Sir:—We take pleasure in informing you that the Boiler purchased from you, which we have had in use about five months, has given the best satisfaction, and has borne out everything you claimed for it. As a steam generator we have never seen anything equal to it. We consider the saving of fuel as being very great compared to ordinary boilers. If we had need of more steam capacity, we should most certainly use your Boiler in preference to any other. You are at liberty to use this, if it will be of any service to you. Yours truly, UNITED STATES WATCH CO., F. A. GILES, Pres't. Pennsylvania Hospital for the Insane, Philadelphia, August 11, 1866. My Dear Sir:—In my annual Report of this Institution, for 1865, I stated my high estimate of your Boiler, for safety, economy, and general efficiency. Additional experience has tended to confirm all that I then said, and if we required additional Boilers, for any purpose, I should certainly recommend yours. Very truly yours, THOMAS S. KIRKBRIDE. Jos. Harrison, Jr., Esq., Philadelphia. Philadelphia, Aug. 10, 1866. Joseph Harrison, Jr., Esq.: Dear Sir:—The "Harrison Boiler" we bought of you, some four months ago, has given us perfect satisfaction. The Boiler is placed over one of our heating furnaces, and, in consequence of the steam-pipe connections with our main steam pipe, we have no means of testing its economy in fuel. We believe it to be safer and more economical than the Cylinder Boiler, and have no hesitation in recommending it as admirably adapted for Rolling Mills. Its length, the same as the length of a heating furnace, enabled us to place it immediately over the furnace, requiring no additional space, thus avoiding the necessity of locating the furnaces at an inconvenient distance from the machinery, which the ordinary Cylinder Boiler requires. Very truly yours, VERRAE & MITCHELL. Philadelphia, Aug. 15th, 1866. Joseph Harrison, Jr., Esq.: Dear Sir:—Before ordering one of your Boilers, we sought information respecting them from several of our friends who were using them. Their testimony was of such a character that we felt no hesitation in adopting it, and it has more than answered our expectations. We recommend them as safe, very economical, and easily managed; they possess fully all the advantages you claim for them. Very respectfully yours, L. MARTIN & CO., Manufacturing Chemists, City Office 140 South Wharves. Atlantic Mills, Ellwood, Atlantic county, N. J., August 18th, 1866. Mr. Joseph Harrison, Jr.: Dear Sir:—We have had one of your Six-slab Boilers in use in our Paper Mill for five months. We consider it unequaled by any other make of boiler now in use. With less than one-half the fuel it produces more and drier steam than any boiler we ever used. It is simple, easily managed, and perfectly safe. Our Boiler bleaches the stock for, and dries one ton of paper daily, with one cord of pine wood per day. Very truly, MORRIS, IRVING & HICH. Mercantile Printing Rooms, Franklin Building, Philadelphia, 16th Aug., 1866. Joseph Harrison, Jr., Esq.: Dear Sir:—I am very much pleased with the Boiler you put in for me some time or ten months ago. It has been in constant use—no trouble—no repairs—no stopping to clean out, and steam can be "got up" in about twenty minutes. It required less coal than the Cylinder Boiler formerly used here, although it is doing a great deal more work. I cheerfully recommend it as being and doing all that you claim for it. Yours very respectfully, JAMES R. DODGERS. Daily Evening Bulletin, Philadelphia, Sept. 1, 1866. Joseph Harrison, Jr., Esq.: Dear Sir:—We have one of your 36 Horse-power Globular, Five-Slabbed Boilers, known as the "Harrison Boiler," in use now nearly five months, and as a safe, reliable steam boiler, and for economy of fuel, we think it cannot be equaled. We have a ten horse-power engine, running eight hours per day, with an average saving of 30 per cent in the use of fuel over the old-style boiler. Our Engineer, Mr. George Wood, has had over thirty years' experience in the management of boilers, and he has no hesitation in pronouncing the Harrison Boiler the "Best" he ever worked. Very respectfully yours, EVENING BULLETIN ASSOCIATION, 607 Chestnut-st. Earle Stove Company, Worcester, Mass., Sept. 3, 1866. Joseph Harrison, Jr.: Dear Sir:—Before purchasing your boiler, we examined with much care the various kinds now in use, determined to get "The Best." After eight months' trial, our experience confidently confirms the correctness of our judgment in making choice of yours. Our Presidents (T. K. Earle), and Treasurer (Edward Earle), who have in their Card Factory, one of the best of tubular boilers, are now putting in one of yours. We refer you to our Engineer, Mr. Frederick Edwards. Truly yours, EARLE STOVE CO., SIDNEY SMITH, Supt. Worcester, Mass., Sept. 3d, 1866. After an experience of twenty years in running the most approved boilers and engines in use, I regard the Harrison Boiler, made by Joseph Harrison, Jr., of Philadelphia, the most economical for fuel, safest, quickest working, and one that will give the steadiest motion to the engine with the least attention. FREDERICK EDWARDS, Engineer Earle Stove Co., Worcester, Mass. Worcester, Mass., 9th mo., 6th, 1866. Joseph Harrison: Dear Sir:—We received your letter, and in answer will say, we are highly gratified with Boilers. The one we are using at the Earle Stove Co. has been in operation, since the first of the year, in perfect order. We have just got in operation the last Boiler at our Card Factory, and are running it beside a Tubular of about the same capacity: so far we find a saving of about one-half by actual measurement. Truly yours T. K. EARLE & CO. Alpine Mills, Howards, Center county, Pa., September 8, 1866. Joseph Harrison, Jr., Esq.: Dear Sir:—It gives me great pleasure to be able to inform you that your Boiler comes up to the most sanguine expectations; in fact, all that you can possibly claim for it: being economical, safe, and a speedy generator of steam. Since they were first put up in the spring (which, by the way, was done without having a mechanic on the ground, except the mason), according to your plans, sent gratis, the first leak, trouble, or delay has yet to make its appearance. Steam is kept up from 75 to 90 lbs. for Wm. H. Haney's (1015 Sansom street), 25 horse-power Oscillating Engine, with saw dust, there being but a 25-feet iron stack of 2 feet diameter. . . . I am, dear Sir, yours very respectfully, PERCY H. WHITE, Agent. Lincoln Mills, S. W. cor. 23d and Spruce streets, Philadelphia, Sept. 10, 1866. Joseph Harrison, Jr., Esq.: Dear Sir:—In reply to your letter of the 8th ult., I would say that I have been using the "Harrison Boiler" for more than two years, and it gives me great pleasure to state that I find it entirely satisfactory. I have had both Cylinder and Tubular Boilers in use, and have consequently been able to compare each of them with yours. I have two of your boilers of 75 horse-power each in use, and my engine is 70 horse-power. I do not require more than 50 lbs. of steam, but would not hesitate to run up to 200 lbs., if necessary required me to do so. I had each of the slabs tested in my presence to 600 lbs. to the square inch. I know that it requires less fuel than the best of either the Cylinder or Tubular Boilers. My neighbor, with about the same machinery, using the steam for power generally, and heating his Mill with exhaust steam, informs me that he burns four tons of coal per day under his Cylinder Boiler, while I used less than two tons per day, during the coldest days of last winter, and heated my Mill with live steam, in addition to the amount required for power. The question of durability is one of time. I think that in consequence of the ease with which it can be cleaned or repaired, that it will last far longer than any other kind now in use. It is perfectly safe. There is no danger whatever of explosion. I do not hesitate to recommend it. If I ever need another boiler, I will get one of yours in preference to any other that I now have any knowledge of. Yours truly, SAMUEL W. CATTELL. Superintendent's Office, Camden and Atlantic Railroad, Camden, N. J., Aug. 21, 1866. Joseph Harrison, Jr.: Dear Sir:—You ask our opinion of the safety, economy in fuel, and general merit of the Harrison Boiler we have in use. I deem it a safe Boiler; from its construction I do not think it possible that a disastrous explosion can occur. It is a rapid generator of steam, and requires less fuel than any boiler that has come under my notice. . . . . Very respectfully yours, G. W. N. CUSTIS, Supt. Philadelphia, Aug. 10, 1866. Joseph Harrison, Jr., Esq.: Dear Sir:—Having charge (as administrators) of the Worsted Mills of the late Mr. Samuel Yewdall, at which the recent terrible explosion of a wrought-iron boiler occurred, we have decided to avoid a recurrence of such a calamity in the future, and, believing your Boiler to be the only one absolutely free from danger from explosion, and at the same time equal, if not superior, as a generator of steam, and in economy of fuel, to any boiler now in use. You will please accept our order, to furnish us for said Mills, two fifty horse-power Boilers, to be used separately or in conjunction. By complying quickly with the above order, you will very much oblige, Yours truly, JAMES HUNTER, } Administrators N. R. SUPLEE, } Rock Island Manufacturing Company, Charlotte, N. C., August 22, 1866. Mr. Joseph Harrison, Jr.: Dear Sir:—Our experience with your Boiler warrants us in bearing testimony to its superiority over any other with which we are acquainted. Ours is a 100 horse-power boiler, and drives six sets of woolen machinery, and furnishes steam for our dyeing operations, and for heating the mill. Our fuel is wood, and we use three cords per day to do all our work, whereas, we formerly used that quantity under Cylinder Boilers, merely to furnish steam for our dye house, and heating the mill. Our experience is, that in fifteen minutes after applying the fire in the morning, we have on a full head of steam, and our machinery at work. We have had it in use only a few months, it is true, but we presume long enough to test its adaptation to our fuel and our work, and have found it in every respect to come up to your representations. Our Boiler was set up and put to work by a man who never had seen it done, without the slightest difficulty. Your Boiler commends itself for economy in fuel, and its merits need only to be known to render it universally popular. Very respectfully yours, 16 4] JOHN A. YOUNG, President.

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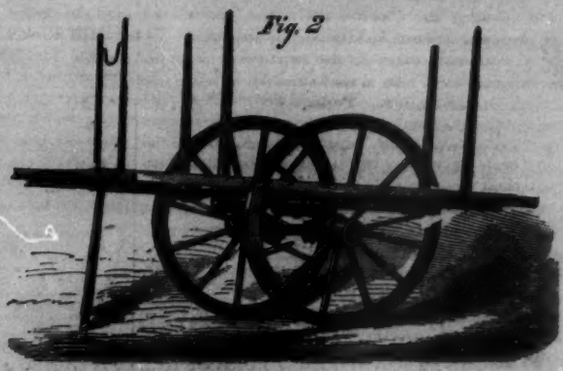
The cost of the steel-plate springs for teams and carriages, the danger of breaking in frosty weather, and their disposition to throw the weight of the wagon, and its contents, out of equilibrium, on roads which are not smooth, are objections which all who drive vehicles have noticed. The inventors of the spring herewith represented have spent years in trying to overcome these faults, and believe that they have succeeded. The spring proper is a cylinder of india-rubber attached to the body and axles by toggle joints, arms, and slides.

Fig. 1 represents a common teaming wagon, with

Fig. 1

Fig. 2

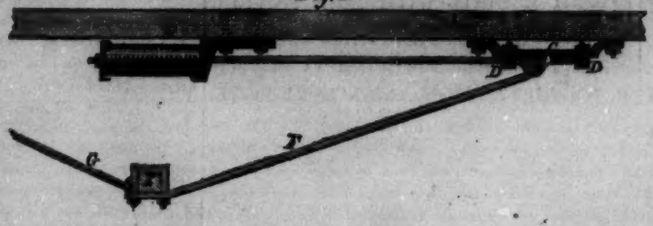


LA BAW AND CAMPBELL'S WAGON AND CARRIAGE SPRING.

the springs attached, the wheels broken away to show their working parts, and Fig. 2 a cart with the patent springs. A A are the springs, which are secured to the body or the frame by proper clamps and staples. A rod passes through the center of the spring, furnished with an embracing cast-iron head and nut, B. The other end of the rod is of flat iron and slides on the plate, C, provided with guides, D (see Fig. 3). E is the axle to which the brace, F, is bolted, the other end of the brace being jointed to the sliding rod at C. The axle clip is pivoted to the brace, G, the other end of which is secured to the wagon frame.

Now the action of the springs can be readily comprehended. As the weight of the vehicle with its load brings the axle and springs nearer together, the spring is compressed longitudinally. A considerable motion of the axle effects but a slight movement of the springs, the tension of which may be increased or diminished at will by tightening or slackening the nut, B. A compression of the springs to the extent of one inch will give three inches perpendicular motion to the axle, and the weight of the load coming endwise on the springs, they can bear a larger proportionate strain than the ordinary steel springs, and when the wheels go suddenly down into a hole their elasticity in a longitudinal direction tends to assist in raising the load.

Fig. 3



The inventors claim that this spring is not required to be more than one-fourth the weight of the steel spring to sustain the same load, and can be manufactured at half the cost. It is so simple in construction that it can be made by any ordinary blacksmith, and can be adjusted to any load. It is very durable, and unaffected by the frost. For light vehicles the springs can be made tapering so that they are more sensitive and easy. The improvement appears to possess desirable features which in some important particulars make it superior to the ordinary springs.

Patented by George W. La Baw and Peter F. Campbell, of Jersey City, N. J., who can be addressed as Campbell & Le Baw, box 24, as above, for State, county, and manufacturers' rights.

The Franklin Institute.

From advance sheets of the proceedings of this society, kindly furnished by Mr. Henry Morton, the Secretary, we copy the following items :—

The Sand Patch Tunnel on the Pittsburgh and Connellsville Railroad is cut through, its total length being 4,750 feet, by 23 wide, and 19 high. It is intended for two tracks.

In the new system of drainage applied to London, a large amount of the sewage matter collects at a level, requiring the use of pumps to remove it. To meet this demand a system of engines, etc., have been established at Crossness, by which this matter is raised 19 feet 6 inches, and thrown into a reservoir constructed for its reception. This reservoir covers an area of 6¼ acres, is 14 feet deep, and has a capacity of 24,000,000 gallons. It is arched over with brick-work, supported on 644 piers, and is covered with earth and sod.

It is usual to discharge this reservoir into the river about half an hour before high tide, but during heavy rains it is filled and emptied four times in the 24 hours.

The engines are four in number, each working eight pumps, which are of the usual plunger construction; their aggregate capacity amounts to 29,326 gallons per minute. The minimum amount raised in 24 hours is 38,000,000 gallons, the maximum 100,000,000 gallons.

Robert Grant, of New York City, has improved the reservoirs for the gases of lime lights by the use of iron cylinders instead of india-rubber bags. The gas is condensed in these cylinders, so that the apparatus of weights, press-boards, etc., is unnecessary. The cylinders are nine inches in diameter by thirty inches long, and weigh, when charged with gas up to thirty atmospheres, only twenty-six pounds. Each cylinder contains thirty cubic feet of gas. Nitrous oxide and carbonic acid can be held in these reservoirs in liquid form. Another improvement in the use of gases for experiments, etc., is that of making the orifice for their escape through the closed end of a tube, by means of a perforation much smaller than the diameter of the tube itself, the end of the tube being flat, or square across. This prevents the flame from running back and sometimes extinguishing the light.

A test for gilt articles to distinguish them from those which are simply made of a gold-colored bronze, is announced by Weber. It consists in the application of bichloride (the common chloride) of copper in solution, which makes a brown stain on other articles but does not affect those which are gilt.

Bronzing Gun Barrels.

The *Mechanics' Magazine* expresses surprise to learn that the gun barrels used by our army in our late war were bright polished, instead of being bronzed. It says that the movements of the Union armies were on several occasions detected by the Confederates by the sheen of the sun or moon on the barrels, when secrecy was important to success.

It has been a matter of no less surprise to us. A bright barrel has other disadvantages beside that of being a tell-tale and perhaps thereby ruining an important movement. In sighting over a polished tube the glare of the sunlight fatigues the eye and diverts the aim. This is so well known that no true sportsman would think of polishing the barrel of his rifle or fowling piece. It is a remnant of the old nonsense about "the pomp and circumstance of glorious war," retained by Government officials, after it has been rejected by sensible people. In using a fire-arm in the sunlight, a bright barrel will heat much quicker than a bronzed one. Beside this, the work of the soldier would be materially reduced and the durability of the weapon increased, by the adoption of bronzed iron work, about the musket and rifle. The subject is one of considerable importance.

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